VETERINARY MEDICINE

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Report of the 55th Annual Meeting, United States Livestock Sanitary Association (Abstracts and notes of papers and committee reports)

Continuous Phenothiazine Therapy for Horses

Sulfaquinoxaline Medication of Chickens

(Complete Index on Page VIII)

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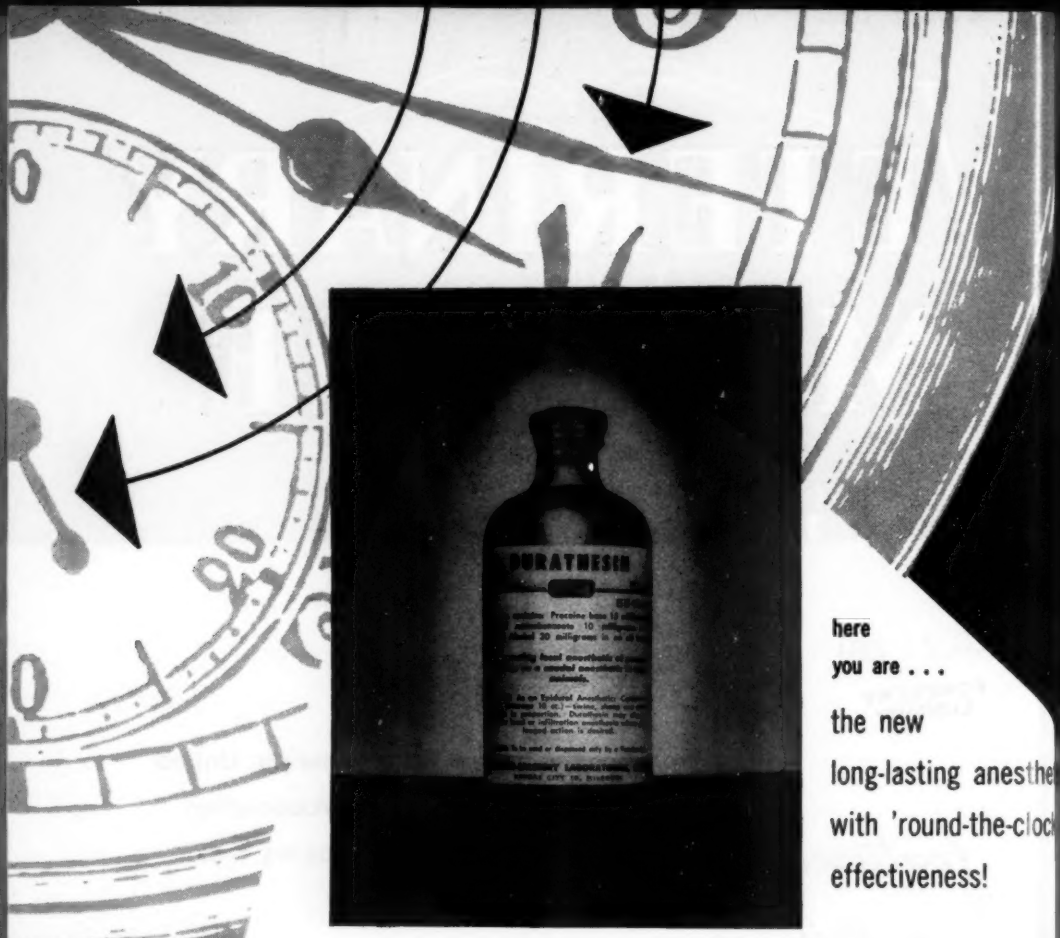

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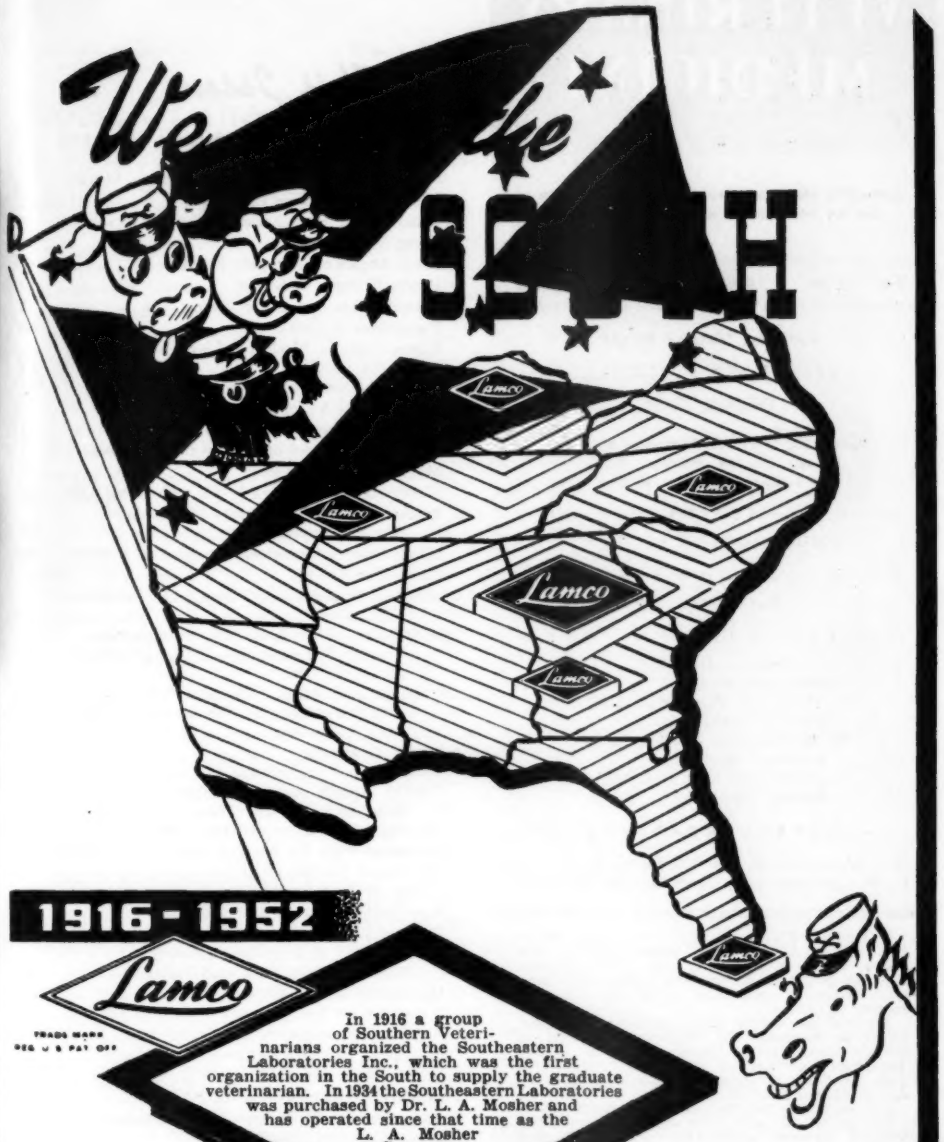
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Report Of The Fifty-fifth Annual Meeting, U. S. Livestock Sanitary Association, Kansas City, Missouri

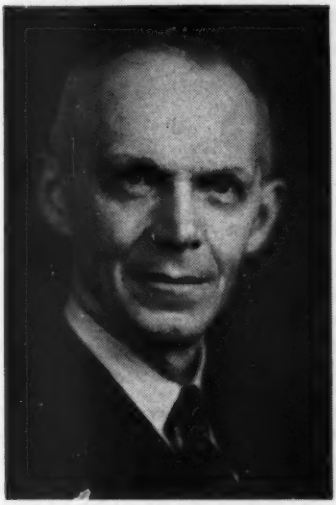
A LARGE attendance of members and visiting livestock officials and producers assembled in Kansas City on November 14-16, 1951, to attend the sessions of the 55th annual meeting of the U. S. Livestock Sanitary Association. Before the meeting was concluded, 378 had registered, 30% of whom were visitors. The president, Mr. F. E. Mollin, Denver, Colo., secretary of the American National Livestock Association, was chairman during this meeting.

Address of Welcome

The Honorable John B. Gage, former mayor of Kansas City, Mo., extended the welcome of the community and city to this association. He pointed out that because Kansas City is located in the heart of the livestock producing region, it is a logical meeting place for this association. He spoke of the leadership provided by the Association in the eradication of tuberculosis, brucellosis and foot-and-mouth disease, and the action taken up to this time to provide leadership for successful operation of campaigns for eradication of hog cholera and other new diseases as they may appear. Growers and producers have confidence in this organization and its guidance and the results speak for themselves. Mr. Gage cited the situation in reference to disease in Europe and the fact that in Great Britain incidence of foot-and-mouth disease and tuberculosis in livestock is a major concern.

In response to the welcoming address, Dr. Ralph L. West, state veterinarian of Minnesota, and vice-president of the organization, reminded his listeners that few people realize what has been done or what are the present activities of the Association. The health of the nation is dependent upon a healthy livestock industry and, without doubt, it has been a major factor in producing the strength and power of the nation.

At these meetings, as they are now conducted, all interested segments of the livestock industry have opportunity to sit down together and work out common problems of producer, control official, processor, sanitarian, practicing veterinarian, and others, and for determination of policies to be followed. These activities have made possible a program that has afforded opportunities and made this the safest country in the world for investment in the livestock industry, including the poultry industry.



Dr. Ralph L. West, State Veterinarian of Minnesota, St. Paul, was elected President of the U.S.L.S.A. for the ensuing year.

President's Annual Address

The president, Mr. Mollin, stated in his opening address, that the livestock industry is the basis of our whole agricultural economy. The need for food is greater today than at any time in the history of our country. Meat is the important item in that need.

He compared the cost of animal disease today with that of previous years. To cite an example, he recalled his experience as a boy on a Nebraska farm where in one year hog cholera accounted for the death of 105 of 113 head of swine. The loss of a single steer in the pasture or feed lot at that time seemed of no great consequence. In contrast, today, increased expense of production, coupled with the increased value of the product, makes it a prime necessity to promote the well being of herds and flocks.

He termed disturbing one aspect of the tuberculosis eradication project which has concerned men on the western range areas. Cowmen were assured when the modified accredited program was being promoted in range and semi-range areas that, if they would only clean up their herds on the basis proposed, there would be opened to them, without restriction, the markets of this country for their product and they would benefit not only from

Dr. R. A. Hendershott, State Veterinarian of New Jersey, Trenton, is the Secretary of the U.S.L.S.A.

this fact but from increased prices as well. However, Mr. Mollin declared, in one state at least, and possibly in others, the restrictions upon the movement of steers into the state relative to their tuberculosis status is more rigid than was the case with cows and heifers when the modified control program was promoted in the West.

This brought him to the question of uniform state sanitary regulations, in regard to which he commented on the rights of the federal government regarding interstate shipment of cattle, which are unquestionable under the responsibility as national custodians of the health of herds and flocks. At the same time, the question of state rights, which temper regulations governing such movements, cannot be ignored. There exists, as a consequence, a seemingly impossible situation and adjustments were recommended that would accomplish the purpose intended and which would be cooperative in effort.

Control of new diseases is an ever moving battle. Mr. Mollin recalled that everyone thought that the development of hog cholera antiserum would stop the terrific losses suffered by the pig-raising industry. The reason that it has not accomplished this objective completely is because of natural carelessness of people, which has resulted in new outbreaks of this disease or has established foci of infection. The industry is watching with interest the recently developed vaccines, which offer hope of immunity to hog cholera without the use of live virus.

The livestock industry must recognize the interest of public health officials in livestock health and cooperate with these people wherever possible and practical. There is need not only for research to determine the relationship between animal diseases and public health, but also for presenting related facts to the general public that will assist control efforts.

Report on Public Relations*

The Committee reported that it had functioned with the customary routine ineffectiveness. The sole purpose of the Committee appeared to be to get stories about the convention into the local newspapers and onto the wire services. About average results appeared to have been attained. The local newspapers had carried a story about the convention each day. The diligence of reporters for the Star and Times and the Drovers Telegram, all of Kansas City, was mainly responsible for these stories, which the Committee regarded as examples of high-class reporting attaining remarkable accuracy considering the extremely technical nature of the subjects. Such stories in the local press always please many of those in attendance at conventions. If anything of permanent value to the Association resulted from them, the Committee is unaware of it.

A great opportunity for public relations is nullified by the Association's policy of not releasing papers presented on its program until after the annual report is published. At this time few of them are ever republished and on an average not more than 10% are abstracted.

If these papers were released when presented and allocated among the veterinary periodicals, it is believed a majority of them would be published promptly and attain a distribution of perhaps 15,000 among veterinarians, instead of 2,000 or less as is the case when they are published in the annual report; and let it not be forgotten these 15,000 veterinarians include those upon whose knowledge and skill state and federal livestock sanitary officials must rely for the conduct of disease control, eradication and prevention programs.

An even greater opportunity for an educational program lies with the farm press, particularly the livestock press. If the papers presented at our meetings were made available immediately in this field, many of them would

*Notes from a report by D. M. Campbell, D.V.M., acting chairman.

serve for background information for editorials and articles throughout the year that would reach hundreds of thousands of livestock owners, without whose informal support no campaign against animal disease can be very successful.

Until the Association changes its attitude on releasing its papers, a public relations committee is stymied. The Committee recommended that it be discontinued.

Resolutions Adopted†

Resolutions were adopted (1) thanking the management and employees of the Hotel President for excellent service to the Association and many courtesies to the members, (2) commending Dr. H. E. Curry, state veterinarian of Missouri for the excellent local arrangements which he had made for the convention, (3) endorsing the request of the Association of Federal Veterinarians for a reclassification of veterinary positions in the federal service, (4) commending the joint Mexico-American Foot-and-Mouth Disease Commission and particularly Dr. L. R. Noyes, codirector of the Commission, for its diligence during the past year in detecting outbreaks of foot-and-mouth disease in Mexico in their earliest stages and urging that the Commission be retained on this work as long as may be necessary to protect the livestock industries of Mexico and the United States from a widespread invasion of foot-and-mouth disease. (Apparently this means for a long, long time since it is known that both the outbreaks which have occurred since December 1949, the one in December 1950 and the one in August 1951, resulted from new importations of cattle from countries in which foot-and-mouth disease is enzootic. There is little reason to expect that these surreptitious importations of potential infection carriers will stop and that outbreaks similar to those of December 1950 and August 1951 will not continue to occur. There is every evidence that there is not in Mexico any residual foot-and-mouth disease infection from the original outbreak of 1946.)

A fifth resolution provided for the compiling of a history of livestock sanitary service in the United States.

Business Meeting

The proposed changes, constituting two amendments to the constitution and by-laws of the Association, designed to place greater control in individual members, were defeated by ballot in the Executive Committee meeting. At present, practically all activities of the Association are under the control of this committee, comprised of one representative from each of the 53 official memberships of the organization and the five officers. The refusal of the Executive Committee to act favorably on the amendments proposed at Phoenix resulted in considerable debate and a threat by a group, consisting primarily of livestock producers, to walk out of the meeting. Inasmuch as the U. S. Livestock Sanitary Association proposed to speak for all segments of the livestock industry, these gentlemen insisted on official recognition by membership of representatives in the governing body.

Two additional motions were presented for adoption as amendments to the existing constitution. One provided that ten delegates-at-large be chosen from the membership to represent segments of the livestock industry, which delegates-at-large would serve as members of the Executive Committee. The second provided that there be added to the membership of the Executive Committee, a representative from each of a group of interested organizations who would choose their representatives in their own ways. These proposals must lie before the Association for one year and will be presented for action during the sessions in 1952.

Louisville, Ky., was selected for the 1952 meeting, to be held at the Hotel Seelbach, on October 29-31.

Officers for 1952

The election of officers resulted in the promotion of Dr. Ralph L. West, Minnesota state veterinarian, St. Paul, to the presidency, and Dr. T. Childs, veterinary director general for the Dominion of Canada, Ottawa, as first vice-president; Dr. A. K. Carr, California state veterinarian, Sacramento, as second vice-president; and Dr. Ivan G. Howe, New York state veterinarian, Albany, as third vice-president. Dr. R. A. Hendershott, state veterinarian of New Jersey, was re-employed for the office of secretary-treasurer.

The 1951 Annual Report

The abstracts and notes appearing on the following pages represent, in so far as possible, the opinions expressed by speakers. Preparation of this material was from longhand notes taken by the reporter during the addresses and in a few instances from copies of papers and

†Notes from the report by D. M. Campbell, D.V.M., chairman of the Committee on Resolutions.

reports to which there was access.

The material presented and discussed at this meeting is of vital interest to practicing veterinarians everywhere. This meeting offers an excellent opportunity for the exchange of ideas, particularly in disease control as it affects livestock interests and the general public health. Veterinarians are encouraged to join the Association, and attend meetings whenever possible to do so.

The official report of the meeting, including the complete papers presented and those read only by title, will be available as Annual Proceedings to be published by the Association in one volume. So much material of value is contained that readers are encouraged to order a copy now. Orders for the Proceedings should be addressed to Dr. R. A. Hendershott, secretary-treasurer, U. S. Livestock Sanitary Association, 1 W. State Street, Trenton 8, N. J. The price is $5. per copy.

FOOT-AND-MOUTH DISEASE ERADICATION CAMPAIGN IN MEXICO

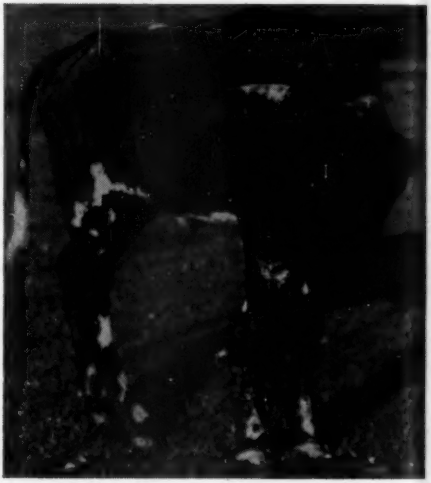
Abstract of an address by Dr. L. R. Noyes, co-director, Mexico-United States Joint Commission for the Eradication of Foot-and-mouth Disease.

On the invitation of Dr. A. K. Carr, chairman of the Committee on Foot-and-Mouth Disease, Doctor Noyes read an address bringing his listeners up-to-date on the progress of the campaign, now five years' old, in Mexico. (Initial outbreak was in December 1946.)

Terrain features in the infected area were cited by the speaker as a problem of major consequence. The field of operation is larger than the combined area of the states of Colorado and Washington. Elevations in this area range from sea-level to 17,000 feet. Tropical jungle and snow-capped mountains are included within the mapped boundaries. Some of this territory was actually considered unexplored until members of the Joint Commission went into it to inspect animals. As can readily be understood, extremes of dry and wet conditions are also presented. Operations have been carried out in semi-arid, arid, and flooded or swampy areas. Transportation to limits of this region is possible only on horseback. This means that quarantine of suspicious herds is often delayed until samples are brought out by painfully slow methods. Control is exercised over this region, divided into districts for purposes of designation, by a network of radio communications.

During the period when international machinery was being organized after report of the initial outbreak, the disease had spread to 17 states and the federal district of central Mexico. Nearly 1,000,000 animals were involved in the first efforts to stamp out the disease. Resistance to the time-tried methods of eradication were partially due to the fact that death rates were low even though after-effects were severe. The peasant (*campesino*) could not comprehend the reason for such drastic measures when it was understood that most infected animals would recover if left alone.

These difficulties led to the vaccination phase of the campaign which was completed almost 18 months ago (July 1950). More than 60,000,000 doses of vaccine were administered during the course of four waves of vaccination. This is believed by many to have been an important factor in the eradication program, yet many vital questions concerning its real effectiveness remain unanswered.



Foot-and-mouth disease.

The final phase of the Mexican campaign to rid that country of foot-and-mouth disease is based on inspection and eradication of infected and exposed animals. For this work, 1,900 persons are now employed full time, or approximately 23% of the largest number ever employed by the Commission. Also in use are 650 vehicles and 1,200 horses and pack animals, each representing about one-third the number utilized during the height of the campaign. With this reduction, economies have been effected—the speaker reported expenditures in August 1951 as $624,000., or 36% less than the same month a year ago. This figure does not include expenses incurred by the

Mexican government. Of a total force of 525 Americans engaged at present in inspection activities, there are 55 veterinarians and 375 livestock inspectors in the field.

Enlistment of aid of the population in the inspection phase of the program has assisted those engaged in the work. Men in some sections are organized into vigilance committees which report animal diseases to the president of the political subdivision that corresponds to a county here. Local priests have been alerted to the danger and they influence their parishioners, particularly the women of farm families. In some schools, children report at roll call each morning on any sick animals they know about. Such information is passed to authorities. Efforts in this direction have proved fruitful. Many cases of vesicular disease have been reported by owners and resident watchmen as was the case in the Comalteco outbreak in December 1950 and the Nautla outbreak in August of this year. The later outbreak involved a larger number of animals than the first.

Speaking in regard to the two outbreaks which have occurred within the past 12 months, Doctor Noyes pointed out the promptness of action taken. In both of these, type A foot-and-mouth disease was diagnosed at the Mexico City laboratory and later confirmed at Pirbright, England. Some infected animals had been vaccinated four times. In the first, a total of 328 hogs, 11 sheep and 62 cattle were destroyed and the premises, including an entire village, were thoroughly disinfected and placed under strict quarantine for 30 days. In the second, Nautla, outbreak, personnel were brought into the area from as far as 600 miles distant. A total of 450 men were employed in the rugged locality four hours' travel time from the nearest highway. Materials were transported over almost impassable roads, much of it by pack animals. Two months were required for cleaning and disinfection operations and at this time (mid-November) susceptible stock is being herded over all sections of the area.

Costs involved in stamping out this latest outbreak in Mexico have forced revision upward of projected costs to American taxpayers for disease eradication in Mexico. Expressed in terms of protection for the livestock industry in the United States, it is considered to be low-premium insurance.

No plans for opening the international border for importation of Mexican stock to the United States are contemplated at this time.

NOTES ON PANEL DISCUSSION OF FOOT-AND-MOUTH DISEASE

Intentional introduction of virus into the United States could be devastating. On the other hand, if alerted livestock owners report vesicular diseases in cattle promptly and there is no delay in confirmatory diagnosis, infection can be effectively controlled by a system of eradication and quarantine.—*M. R. Clarkson, D.V.M.*

▼

Attempts to bypass present barriers to the importation of cattle from countries where foot-and-mouth disease exists are continually being brought to the attention of livestock officials. Mr. F. E. Mollin emphasized the urgency of maintaining contact with legislators to avoid the possibility of breakdown of existing safeguards against the disease.

▼

Vesicular stomatitis and vesicular exanthema are complicating disease factors in diagnosis. It is possible to make a positive differential diagnosis only with laboratory assistance.—*Maurice S. Shahan, D.V.M.*

▼

Virtually no effort is being made in Columbia and Venezuela, South America, to control or eradicate foot-and-mouth disease now reported widespread in both countries. Both A and O types of virus are prevalent.

▼

Substantial quantities of beef are coming into the United States from Mexico. All is being cured under strict surveillance of inspectors and in establishments licensed for processing under federal inspection.

▼

There is at present no effort being made by the USDA to revive the issue of establishing a laboratory for investigations on foot-and-mouth disease. Congress has, in effect, three times failed to appropriate money for the project.

▼

No virus has been found in the wild life trapped and shot in the area of the latest disease outbreak in Mexico.

▼

In case of an accidental or introduced outbreak of disease in this country, federal and state activities would be combined to effect earliest possible eradication by slaughter. No

plans include the use of vaccine as a control measure.

▼

The cost to the American taxpayer of foot-and-mouth disease in Mexico is estimated to total approximately $120,000,000.

LIVESTOCK CONDITIONS—PAST, PRESENT AND FUTURE

Notes of an address by L. M. Pexton, president and general manager, Denver Union Stock Yard Company, Denver, Colorado.

To introduce his subject, the speaker referred to the insistence of employees of the BAI inspection service that regulations governing the movement of livestock be adhered to strictly. He cited early experiences in his career indicating lack of cooperation of livestock producers with officials, which hampered early efforts toward disease control. A small segment of the livestock industry still resists or attempts to evade regulations in the interest of immediate personal profit. That such attitude is shortsighted was illustrated by the examples of the costliness of disease to individual livestock growers, the industry, and the nation.

The speaker referred to his recent visit to South America during the past spring to observe matters pertaining to beef production. He stated that livestock interests there accept foot-and-mouth disease and weight and death losses caused by this widespread plague. Admittedly, death loss attributed to foot-and-mouth disease in Argentina approximates 1% and weight loss of infected animals averages 135 lb. per head. To these losses must be added the cost incident to delay in marketing, carrying and feeding charges, and treatment expense. To dismiss disease losses with such acknowledgment as outlined does not describe the situation observed. Mr. Pexton spoke of observing a sort-out of 200 animals having badly deformed feet resulting from foot-and-mouth disease infection. The condition of these emaciated and weakened animals was described as pitiful. Carcasses from such animals would have been condemned for food in this country. No apparent effort is being made in South America to clean up foot-and-mouth disease and in only a few isolated places are animals vaccinated regularly.

▼ ▼ ▼

Hypoplasia of primary sexual organs is a common cause of sterility.—*Dyar C. Wood, D.V.M.*

PROGRESS REPORT OF THE FEDERAL-STATE BRUCELLOSIS ERADICATION PROJECT

Notes of a paper presented by A. K. Kuttler, D.V.M., in charge of the Brucellosis and Tuberculosis Eradication Division, BAI, Washington, D. C.

The National Brucellosis Committee, which is comprised of representatives of 27 national organizations from the agricultural, livestock and food processing industries and the educational, scientific and medical professions, has continued to support brucellosis eradication in an effective way. It has been suggested by this committee that the recommendations of the U.S.L.S.A. for brucellosis eradication in domestic animals, which was approved by the BAI, be used as a discussion guide by brucellosis eradication committees organized within the states and counties. There are, at the present time, only 14 states which have such committee organizations. It is interesting to note that in eight of these the appropriations for control are 62% of the total funds appropriated by all the states.

The extension service is participating in an effective way in organizing these committees and in doing educational work so essential to successful conclusion of the undertaking.

The greatest single obstacle to furthering the brucellosis campaign is the shortage of veterinary personnel. It has been determined that in most sections of the United States one man can take care of 10,000 to 15,000 cattle so far as the brucellosis eradication project is concerned, providing he spends his full time on duties connected with this work. Considering the animal population, this would require the employment of about 4,000 men to cover the entire United States. There are, at the present time, less than 1,000 Bureau and state veterinarians engaged in the plan. It can be seen that the enlistment of help outside the profession will be necessary if consummation is to be accomplished within a reasonable length of time.

The percentage of infection as calculated for herds under supervision has been reduced from 3.5% reported in 1950 to 3.1% for 1951. The educational project, which is conceded by all to be the most vital to the success of this program, has made satisfactory progress during the past year. Agreements reached regarding all phases of this matter by those in positions of leadership give assurance that the project will ultimately be prosecuted to a successful conclusion.

SHEEP SCAB CONTROL

Notes of an address by Ray Willoughby, San Angelo, Texas.

This discourse vividly illustrated two important factors in disease control. (1) The power of a well organized industry when it makes up its collective mind to rid itself of a costly disease, and (2) the disastrous effect of complacence and neglect when a disease is reduced to a point where it is no longer an economic problem and danger from it is thought to be past.

The National Wool Growers' Association is the oldest livestock organization in the United States. It was organized in 1865. The war between the states had given the wool growers a plentiful "helping" of high prices and they had found them to their liking. The primary, perhaps sole, objective of the new association was a tariff that would perpetuate those high prices.

Ewe showing advanced lesions of psoroptic mange with loss of wool and presence of scab.

By the year 1900, the National Wool Growers appeared to have the answer to the question, "How high can a tariff be?" But by this time, sheep scabies was becoming the problem of first magnitude throughout the range country, where a barely visible, eight-legged parasite had come to look more horrendous than a free-trade Democrat. The Association threw the full force of its organization against the new enemy and by 1907 had obtained Congressional appropriations and BAI approval of a sheep scabies control and eradication program. At that time, the inspectors traveled on horseback and transported their supplies on pack mules and roamed far and wide over the mountain fastnesses. Dr. H. E. Curry of Missouri, Dr. S. O. Fladness of Washington, D. C., and Dr. A. C. Rosenberger of California, are three of that numerous troop who are still active in state or federal work. By comparison with present day insecticides, the lime and sulfur dip which was used was as inefficient as the mode of travel, and yet progress was made. After eight years the vatside test for the dip was developed and thereafter results improved somewhat. By 1917, the infected states could be quarantined and territory from which the scab mite had been eradicated thus protected.

In 1924, a nicotine sulfate dip was accepted for official use. By 1930, satisfactory control of the disease was attained and a few years later essential eradication west of the Missouri River was effected. However, there were some sheep in the eastern states and some scab infection there, but these eastern bands were of poor grade and produced inferior wool. They were not considered of any importance to the livestock industry. There was no demand for them in the range country and it was not considered that the infection among them constituted any hazard to the industry.

This confidence was justified by the results for a time, but by 1940 Louisiana, which borders on the sheep country, had become badly infected. In 1941, the BAI engaged in a cooperative program with Louisiana for the eradication of scabies. The outbreak of the war, of course, soon ended the project. Following the war, things happened fast. The transportation of livestock had been revolutionized. The auction market had come into popularity and the price of sheep skyrocketed until almost any animal with more than three legs was salable on the range. Trucks were loaded with infected sheep at Louisiana sales and driven night and day into the range country where they could be sold at twice what they cost in Louisiana. In little more than the time it takes to tell it, 19 states were infected.

In June 1951, a meeting was held at Salt Lake City where everyone blamed everyone else for allowing the range to become reinfected and all were probably right. However, plans were laid again to eradicate the scab mite, and when the plans are activated, the National Wool Growers' Association will be in there "pitching" and will stay till the task is done and this time we mean "done." Owing principally to improved insecticides and in part to better roads, better means of travel, and better equipment, little difficulty is expected in achieving eradication if sheep owners will cooperate—*D.M.C.*

SOME ANGLES OF ATROPHIC RHINITIS

Abstract of a paper presented by Paul C. Bennett, D.V.M., Diagnostic Laboratories, Iowa State College, Ames.

Atrophic rhinitis of swine has become of major concern to growers in the middle-west, hog-producing states. The disease, however, is not confined to the Corn Belt.

Peculiarities of this abnormality present problems for which there are no satisfactory answers. Some aspects of the disease are prominent and attract immediate attention. These include the well known history and symptoms of violent sneezing, nasal hemorrhage, distortion of the snout, pneumonia, and growth-stunting effects of the infection.

There are, in addition to and in absence of prominent symptoms, less conspicuous angles which, on study, reveal facts to cause upward revision of previous estimates of loss and damage due to this infection. These have been vastly underestimated. To substantiate this observation, the speaker stated that atrophic rhinitis is a disease of unknowns. Numerous instances have occurred that point up the insidious nature and perhaps intermittent activity of the disease. Most of the case histories obtained at the Iowa laboratories during the past three years indicated that the disease had been present in the herd from at least one to five years before its presence was suspected or demonstrated.

Most unfortunately, the infection involves best breeding lines of purebred herds and spread has been wide by purchase of breeding stock, boars and gilts, for addition to disease-free herds. Many cases have been revealed at autopsy that were unpredicted on the basis of history and clinical evidence. Etiological agent or agents of the disease are unknown. A number of bacteria have been suspected as having etiological significance. Virus has been suggested and recently the occurrence of trichomonads in the nasal cavities of a large percentage of infected animals has been reported. (See VETERINARY MEDICINE, 46:478 [Dec.], 1951.)

Atrophic rhinitis. Markedly affected with practically complete disappearance of nasal turbinates, revealed by cross section of head immediately posterior to last molars. There was no deviation of the snout in the case illustrated. Photo courtesy of Dr. W. W. Wempe, Lawrence, Kans.

Experience suggests that only a small proportion of animals actually affected can be detected clinically. Few visibly affected specimens are submitted for laboratory examination. Furthermore, in at least 10% of cases in which there was almost complete disappearance of nasal turbinates, few exhibited recognizable facial distortion. Most pigs found affected on autopsy, exhibit no clinical evidence of the disease immediately prior to examination.

In a recent survey at the Iowa laboratory covering a period of only six weeks, an incidence of 41.5% in a group of 142 pigs over three weeks of age was determined. Of these, 44% were slightly affected; an equal number were markedly affected; and 12% revealed complete disappearance of the turbinate structures.

The likelihood of direct association of atrophic rhinitis with pig pneumonia and other infections of swine has been discussed. It is rather characteristic for laboratory findings to reveal one or more of almost the entire list of swine diseases associated with this infection. Understandably, pneumonia is prominent. By sagittal sections through the head, it is also possible to demonstrate changes in nervous tissue adjacent to posterior nares. These result in nervous symptoms often observed. Signifi-

cance of changes observed in the pituitary body are less understood.

Admittedly, many angles presented are in the field of unknowns so that theories, expressed in general terms only, explain pathological processes observed. Much study needs to be done for a better understanding of the many aspects presented by this disease.

EDEMA DISEASE OF SWINE

Notes of a paper presented by H. C. H. Kernkamp, D.V.M., M.S., School of Veterinary Medicine, University of Minnesota, St. Paul.

Edema disease of swine, also referred to as gut edema, paralytic toxicosis, ascites, intestinal edema, and many other designations, is an ailment of young animals. Pigs from six to 20 weeks of age are affected; the largest percentage between eight and 16 weeks.

Symptoms of gut edema are characterized by a sudden onset and short clinical course. This course is seldom longer than five or six days and in many cases termination is within 24 hours after the onset of recognizable symptoms. Disturbed locomotor function or unsteadiness of gait is an early sign of the disease. Side-to-side swaying, or actually swaying and standing on one spot, is observed in affected lots. Stilted, gait and leg flexion giving the suggestion of stiffness, is frequently reported. Finally, complete motor-paralysis is observed. On handling, pigs act as though they were under complete sedation. The normal squeal and struggling of the healthy pig when handled is absent.

Although some practitioners have reported as high as 50% incidence in individual herds, the normal varies from 4% to 40%. Usually not more than 10% are infected.

Postmortem findings are primarily those of edema, abnormal quantities of fluid in the tissue spaces. This is apparent under the skin, around the nose, eyelids, base of the ear and ventral surfaces of the body. Excessive accumulation of fluid is regularly observed in the pericardial sac, thorax and abdominal cavities. This ascitic fluid is peculiar in that it will clot and large fibrinous masses accumulate on agitation. Edema of the stomach wall can best be illustrated by making a longitudinal incision along the greater curvature of the stomach. Edema is also noted around the spinal cord to such an extent that fluid will run when the cord is cut.

Remedial procedures have so far failed. Incidence is on the increase throughout the Corn Belt. More attention must be given by investigators to problems posed by this serious disease of swine.

TRANSMISSIBLE DISEASES OF SWINE

Notes of a report presented by J. D. Ray, D.V.M., Omaha, Nebraska, chairman.

The incidence of hog cholera in the United States has remained unchanged during the year. It continues to be the most destructive disease of swine. An analysis of the report submitted by livestock sanitary officials of 46 states reveal that only nine reported an increase in hog cholera outbreaks during the past 12 months. Seven of these were eastern or far western states. None of the nine has a heavy hog population. The so-called variant hog cholera, of considerable concern during 1949 and 1950, was not reported as an important field problem in 1951.

Erysipelas might be considered the second most important swine disease. A survey indicated that it was prevalent in 22 states and 17 of these reported an increase in incidence. The simultaneous use of swine erysipelas antiserum and vaccine is permitted in 24 states. In view of the fact that the vaccine can be a dangerous product to both animals and man, the Committee commends the Virus-Serum Control Division of the BAI and the several livestock sanitary officials who have effectively controlled distribution of this product, which has worked for the good of the swine industry. It was recommended that the Association actively support the continuation of control measures for the distribution of *Erysipelothrix rhusiopathiae* vaccine through veterinarians.

Enteritis, edema disease, atrophic rhinitis, and transmissible gastroenteritis are all considered to be important transmissible diseases of swine of economic importance in major swine-producing states. Edema disease and atrophic rhinitis, particularly, are believed to be on the increase.

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The possibility has been visualized, that with the present methods of artificial insemination of poultry, 14,000 chicks could be obtained in one season from a single cock.—*G. C. Van Drimmelen.*

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Infection of the genital tract is an important cause of infertility in mares. Certain pathogenic organisms isolated from the vagina and cervix have spermicidal effect. — *Josephine Deubler, V.M.D.*

COCCIDIOSIS IN CATTLE

Abstract of paper presented by Leonard R. Davis, Ph.D., and George W. Bowman, Auburn, Alabama.

Coccidiosis in cattle is responsible for greater losses, particularly in dairy calves, than most dairymen are aware. A veterinary committee report, concerned with the problem in 1948, stated that coccidiosis was the third most important of the parasitic diseases of cattle. Earlier, investigators found coccidiosis to be a major factor in persistent diarrhea of young dairy calves. Dr. A. O. Foster estimated that coccidia are responsible for an annual loss of $10,000,000. to the cattle industry. In the face of these facts, many articles on calfhood diseases fail to list coccidiosis as one of the causes of calf scours.

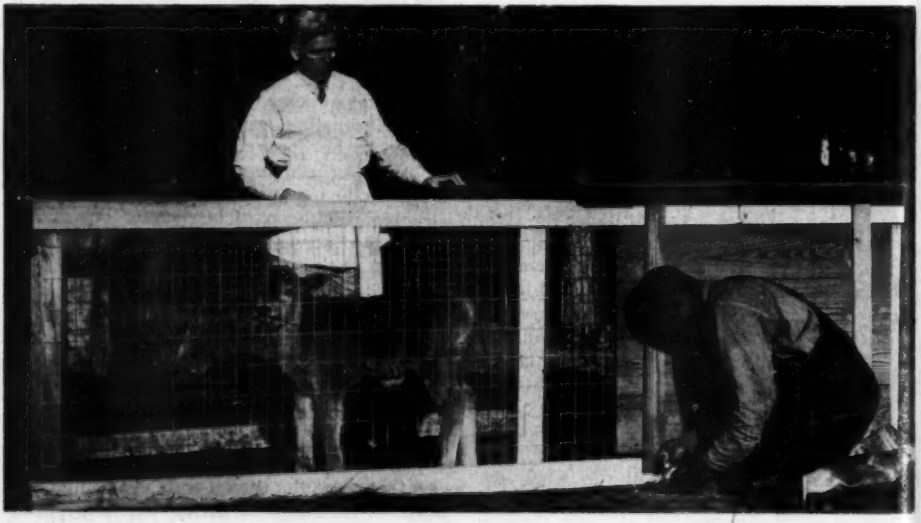
The investigations reported by the authors were conducted at the Regional Animal Research Laboratory, Auburn, Ala. Ten species of these small protozoan parasites were identified, all belonging to the genus Eimeria. Nine of these were found as naturally occurring infection in a group of 20 calves.

Coccidia spend their reproductive lives in the small and large intestines of cattle where they cause damage in proportion to the severity of the infection and the area attacked. Infection by some species results in more severe symptoms than others.

After the parasites have completed their cycles in the intestines, they produce oocysts which are carried out with the feces. This is the "resting" stage of the life cycle. Under suitable environmental conditions of moisture and warmth, the oocyst undergoes sporulation, or the protoplasmic mass, within the outer shell of the oocyst, divides to form first sporocysts and later sporozoites. This process requires from two to seven days or longer; the oocyst is not infective until sporulation is completed. Cold weather prolongs the process and drying may destroy the parasite. Viable oocysts of *Eimeria bovis* and *E. alabamensis* were found by the authors in the soil of a calf pen 8½ months after an infected animal had seeded the small lot during a period of only one week.

Infected calves usually appear undernourished. All display rough coats, drooping ears and sunken eyes. Diarrhea, caused by coccidiosis, normally appearing in calves older than three weeks but younger than six months, may be explosive or involuntary with accompanying soiling of hind quarters. Blood and mucus may or may not be a feature and microscopic examination of stools and identification of the parasite may be necessary to establish a positive diagnosis. Prolonged diarrhea results in extreme dehydration, loss of weight, and death. Temperature reactions are not dependable.

Postmortem lesions are primarily those of



Portable calf pen used in Alabama experiments in studies on the control of bovine coccidiosis. This simply constructed enclosure is 10 ft. long, 5 ft. wide, and 3 ft. high. In the picture above, George W. Bowman is supervising the addition of wooden panels to "winterize" a portion of the pen. Note rack for feed and water at the left.

erosion and sloughing of areas of intestinal mucosa. Bowel contents are ordinarily fluid. Hemorrhages and thickening of intestinal walls are less constant. Microscopic examination of

Characteristic symptoms of clinical coccidiosis in a six-week-old dairy calf. Soiled tail and hindquarters, rough coat, and tenesmus are typical evidences of this disease.

mucosal scrapings often reveal myriads of small spindle-shaped, motile merozoites or oocysts in various stages of development.

Transmission of Coccidia

Infective oocysts may be picked up by calves from soiled food and water and by licking at their own bodies or those of other animals. The authors have demonstrated infective stages of the parasites on the ears, legs, bodies and tails of calves. Infective oocysts can be demonstrated in soil samples. Resistance of oocysts to common disinfectants is well known and even scrubbing of concrete floors will not suffice to eliminate parasites, but may furnish optimum conditions for development in the minute crevices of common flooring of calf stalls. Mechanical transmission of sporulating oocysts is considered to be a common means of transmission.

It is easier, state the authors, to prevent clinical coccidiosis than to cure it. Isolation stalls and raised mesh or salt-bottom pens have been employed by some dairymen with success. A portable outside pen system is recommended for dairy calves. A simply constructed enclosure, 5′ x 10′ x 3′ (see illustration, opposite page) is moved to a fresh site once each week. This method takes advantage of the information gleaned from research of the time elements for oocysts to become infective. It also eliminates cleaning and completely removes calves from their own feces or that of other calves. Contaminated ground is left unused for at least a six-month period. If calves are placed in these pens within 24 hours after birth, clinical coccidiosis is usually prevented. In calves raised under such management, there has been demonstrated a marked reduction in the amount of white scours, pneumonia, lice, and worm parasites. No losses for a period of 18 months have been experienced by dairymen who have adopted this system of calf management. Some of these had previously suffered annual losses of as high as 50 to 75% of their calf crops.

TISSUE CULTURE, MODIFIED, LIVE HOG CHOLERA VIRUS VACCINE

Abstract of a paper presented by N. H. Casselberry, D.V.M., and W. W. Walker, D.V.M., Cutter Laboratories, Berkeley, California.

The ideal vaccine for the protection of swine against hog cholera should possess the following characteristics:

1. It should produce a rapid and enduring immunity.

2. It should be safe for all classes of pigs raised under all kinds of management practices.

3. It must not spread disease.

In spite of shortcomings obvious to readers, the simultaneous method of vaccination has made possible expansion of the hog industry to its present status. At the same time, realization that available methods were imperfect has been the stimulus in the search for an agent that would fulfill all the requirements for an effective, safe, and innocuous product.

Boynton and co-workers in California reported *in vitro* culture of hog cholera virus in 1946 (see VETERINARY MEDICINE, 41:346 [Oct.], 1946 and 43:403 [Oct.], 1948). The search for better propagating methods and a satisfactory immunizing product by such tissue culture has been continuous since that time. The original goal was to find a means of cultivation outside the living animal under such controlled conditions as to prevent the possibility of concurrently propagating other pathogens (viruses or bacteria), known or unknown, to normal swine hosts. Such work must necessarily be cautious and, consequently, slow and deliberate. Each passage of virus representing transfers was checked by pig inoculation to assure that the virus of hog cholera alone was being carried from passage to passage. In 1946, Boynton reported that he had succeeded in demonstrating 24 virus passages. Later investigation revealed that some alteration was occurring in cultures; virus produced in the 52nd passage was shown to be of lowered virulence.

'Tests to determine modification of immuno-

genic property were undertaken by vaccination of susceptible pigs weighing 60 to 90 lb. selected from different sources. A total of 94 test animals were injected with the 59th tissue culture passage. Of these, 83, or 88.3%, survived both the vaccination and subsequent challenge to virulent virus. Deaths were attributed to aggravated dormant infections and not to hog cholera, substantiating observation of modification of virulence of the tissue culture vaccine and retention of its antigenicity.

Further modification in virulence has occurred in subsequent passages as determined by regular routine screening tests by pig inoculation. A trial on a group of 60 pigs, assembled from a wide area and which were produced under a variety of conditions and management, is reported. The 150th virus passage, vacuum-dried and reconstituted vaccine, was employed. Fifty-five, or 91.6%, of these survived both vaccination and subsequent challenge of immunity. Survivors were shown to be solidly immune. A similar check on the 152nd passage of virus demonstrated survival of 98.2% of the group vaccinated. A congenital anomaly was recorded as apparent cause of death preventing a 100% performance on this test.

To date, virus of hog cholera has been grown continuously outside the normal swine host for nearly six years and through 180 passages, in the California laboratory. Work has encompassed trials on 900 test pigs during this period. Overall results are considered encouraging. Such virus culture for production of a safe and effective vaccine appears practical in the preliminary phases of this study. No license for manufacture has been applied for as experimental and field information is considered to be too meager.

FIELD TRIAL STUDIES WITH ROVAC

Notes of an address by Max J. Harvey, D.V.M., prepared in collaboration with Robert L. Burkhart, V.M.D., Joseph D. Leaming, V.M.D., Richard C. Percival, V.M.D., Charles R. Schroeder, D.V.M., and Mark Welsh, D.V.M., Lederle Laboratories, Pearl River, New York.

Field trials using rovac,® a rabbit-adapted, modified live virus, hog cholera vaccine, vacuum-dried, were performed under BAI supervision in 74 herds, consisting of 10,147 pigs. Physical examination classified the general health as excellent, 253; very good, 5,525; fair, 2,364; poor or variable, 2,005. The last named were considered as questionable vaccination risks. Animals of all breeds, varying in weight from 20 to 225 lb., maintained under variable conditions, were vaccinated. Test herds were located in Missouri, Virginia, New Jersey, and New York. Only obviously nutritionally deficient, parasitized or sick animals were excluded from the trials. Routine feeding practices were not changed either before or after vaccination. Field trials were conducted under practical farm conditions with limited equipment. Vaccine was reconstituted immediately prior to use. Standard metal syringe of 10 cc. capacity was used with 18 gauge, ¾ in. needle. Sterilization was by boiling. Vaccine was injected into the medial aspect of the ham deep into muscle tissue. No skin disinfectants were used.

Susceptibility of the herds to hog cholera was proved by the inoculation of approximately 3% of each herd with virulent whole blood virus. These pigs were selected and totaled 335.

For active immunization against hog cholera, a single immunizing dose of 2 cc. of rovac was administered. Over an observation period of four to ten months, there have been no deaths from hog cholera in those animals exposed to natural infection. No serious adverse reactions following vaccination occurred. In some herds, only part of the animals on the premises were vaccinated. The remaining susceptible pigs showed no unfavorable reactions attributable to contact with those vaccinated. This indicated that the vaccine, while producing dependable, long-lasting and solid immunity, does not perpetuate disease-producing virus on the premises.

A representative number of animals from each herd, totaling 852 pigs, were challenged 14 days to three months after vaccination by injection of virulent whole blood virus or by contact with pigs dying of hog cholera. Of these, 18 died of other diseases. Twenty-two succumbed to hog cholera; a 97.5% survival rate. Protection to a massive artificial challenge was established within one week after vaccination.

Investigation in the field is continuing to establish how soon immunity is induced. Limited trials to date reveal protection as early as three days postvaccination. Further observations on this point are necessary as is research on durability of serviceable immunity. Antiserum is not recommended for use with this vaccine as it will interfere with the development of active immunity and its duration.

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Make your reservations early for the A.V.M.A annual meeting in Atlantic City, N. J., June 23-26, 1952.

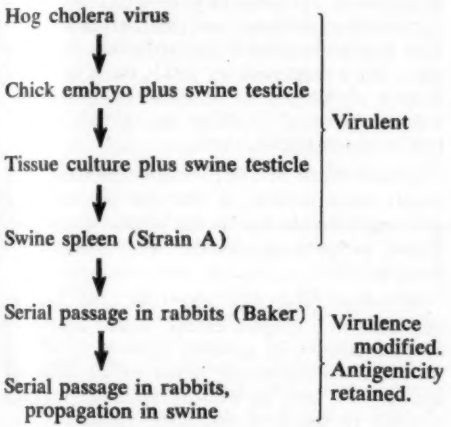
®Lederle Laboratories Division, American Cyanamid Company, Pearl River, N. Y.

A HOG CHOLERA VACCINE PREPARED FROM A RABBIT-MODIFIED, SWINE-PROPAGATED, LIVE VIRUS

Abstract of a paper presented by A. H. Killinger, Ph.D., J. R. Dick, M.A., D.V.M., H. E. Pinkerton, D.V.M., and R. L. Williamson, D.V.M., Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.

There has been developed and made available hog cholera vaccine prepared from rabbit-modified, live virus propagated in swine. It has been designed to overcome the objections voiced by scientists to the use of virulent blood virus for immunization. This product of porcine origin, produced under special license, is a vacuum-dried or modified, live virus vaccine incapable of establishing infection in susceptible pigs, designated for purposes of brevity, M.L.V. History of development of the product may be illustrated by diagram:

History of M.L.V.


Hog cholera virus
Chick embryo plus swine testicle
Tissue culture plus swine testicle
Swine spleen (Strain A)
Virulent
Serial passage in rabbits (Baker)
Serial passage in rabbits, propagation in swine
Virulence modified. Antigenicity retained.

When healthy pigs were injected under experimental conditions, M.L.V. produced a transient fever and a moderate degree of leukopenia. Those animals which carried latent infections developed undesirable reactions. When hog cholera antiserum is injected simultaneously with this new vaccine, both the duration of fever and leukopenia are reduced. In addition, serum has proved to provide immediate passive resistance without interfering with the development of active immunity. This immediate protection has been demonstrated by the manufacturers in experiments on pigs vaccinated with 2 cc. of M.L.V. and 15 cc. of antiserum. Groups from such vaccinates were challenged with 2 cc. of virulent virus at 48 hour intervals from one hour to 14 days post-vaccination. All remained well for a period of two weeks following challenge, whereas controls developed typical cholera.

Field tests have been extensive. These were devised with the cooperation of practitioners in Iowa. On each farm where vaccination was done, at least three pigs representative of the group were checked to prove susceptibility to virus infection. Balance of each of 43 herds, representing 6,578 pigs, were vaccinated with 2 cc. M.L.V. and 15 cc. hog cholera antiserum. At marketing, at least three more animals from each herd were injected with virulent virus to determine resistance. From accumulated data, it was demonstrated that of these, 96.8% survived artificial exposure. Reports of field use are required by the BAI. Bureau report forms have been supplied veterinarians to cover 500,000 doses of vaccine. Analysis of these field reports, when available, should provide adequate information, considering the varied conditions of swine management that would be represented by this large a number of pigs.

Present recommendation is that 2 cc. of M.L.V. be given with a 15 cc. dose of hog cholera antiserum not earlier than ten days to two weeks after weaning. Larger doses of serum may safely be used if indicated without interference with active immunological response of the virus.

Combined with sound principles and practices of sanitation, swine management, nutrition, and control of other diseases to which swine are subject, and elimination of parasites, it is expected that the use of M.L.V. in the manner outlined will prove a forward step in hog cholera control without the liability of establishing foci of infection.

ASPECTS IN CONTROL OF BOVINE LEPTOSPIROSIS

Notes of a paper presented by Charles J. York, D.V.M., Ph.D., Cornell University, Ithaca, New York.

Bovine leptospirosis is a newly recognized disease in the United States. First recorded in Connecticut in 1944, it has since been reported in many different parts of the United States. In the study of this disease, emphasis has been placed on the development of a reliable serological test for detection of the infection. The agglutination test heretofore employed was not considered reliable because of certain technical difficulties and the possibility of questionable interpretation. With a suitable antigen for complement fixation test, the results of detection procedures are now considered to be specific.

Certain refinements are fundamental in evaluating the presence of the disease over any particular area. However, it was reported that the complement fixation test applied at the laboratories at Cornell on 1,074 cattle, representing 105 herds located in New York state, showed 13% to be positive. Within an infected herd the incidence of leptospirosis usually varies between 50 and 75% of all cattle. In such herds, experience has been that 5% of those infected, died. Only 5 or 10% ever showed recognizable symptoms and 20 to 40% exhibited infection that could be detected only by serological testing. Regardless of severity of symptoms, generally about 20 to 25% of cows aborted. It is considered, therefore, that leptospirosis should be added to the list of infectious agents responsible for abortion in dairy cows.

In spreading the infection, it is believed that while other methods may be operative, the primary spread is through the medium of urine from infected or carrier animals. More extensive use of serological methods for detection is necessary before the importance of leptospirosis can be assessed. Such work is progressing in a number of experimental laboratories in the United States.

MEAT AND MILK HYGIENE

Notes of a report prepared by Oscar Sussman, D.V.M., Trenton, New Jersey, chairman.

The Committee emphasized the importance of planning for a target date when all herds of cattle and swine will be placed under an approved plan of brucellosis control. They commended recent actions of some state and municipal health departments which require elimination of disease reactors from herds supplying fluid milk within a given number of years, in most cases five years.

On June 25, 1951, the chairman acted as coordinating chairman of a group representing a number of organizations concerned with public health at a hearing with representatives of the Secretary of Agriculture. On this occasion, a request was made that inspection and sanitation problems as they affect poultry be removed from the jurisdiction of the Production and Marketing Administration of the USDA. A further request was made that since grade-labeling uninspected and uneviscerated poultry was deceitful and misleading that such practice be prohibited. (For earlier report see VETERINARY MEDICINE, 46:87 [Mar.], 1951.)

Requests have been made of the Secretary for a statement as to what action was intended on the proposals made. None has been received. Livestock sanitary and health officials agree that the supervision of programs which involve problems of sanitation and inspection of food products for interstate shipment must be placed in the hands of those qualified and trained for the work, and not under the domination of economic, marketing and sales specialists.

HISTORY OF THE BUREAU'S WORK WITH TUBERCULIN

Abstract of a paper presented by R. R. Henley, B.S., M.S., Pathological Division, BAI, Washington, D. C.

Of all the endeavors of American veterinarians as a group, no one project outshines the achievements in tuberculosis eradication in cattle. A review of the leadership furnished by the Bureau of Animal Industry and of its work with tuberculin points out the interdependence of laboratory investigations with the untiring devotion and zeal of field men. This has made possible the reduction in infection rate, as reported for 1951, for a livestock disease of the greatest importance, both from the standpoint of its effect on animals and its public health significance.

Robert Koch in 1891, found that toxic materials were present in extracts prepared by growing tubercle bacilli on laboratory media. These extracts or filtrates were known as Koch's O.T.

Although tuberculin was first used, and is still used to a limited extent, in the treatment of tuberculosis, its greatest value is its ability to cause characteristic reactions in affected animals but not in healthy animals, making possible its use as a diagnostic agent. It was used for this purpose in 1890, even before Koch's paper was published.

Its usefulness for testing cattle was immediately recognized by veterinarians throughout the world and as early as March 1892, a herd was tested in the United States. The first herd tested belonged to Dr. J. E. Gillingham, Villanova, Pa., and the test was made by Dr. Leonard Pearson, state veterinarian of Pennsylvania at the time, with tuberculin he had brought from Europe.

Preliminary tests with tuberculin were begun in 1892 and in the same year the Bureau announced that it was prepared to furnish quantities for the diagnosis of tuberculosis. It was first provided to federal and state veterinarians, but later furnished without charge to other state, county, and municipal officials on

the condition that the Bureau be supplied with records of all tests and of all autopsies, and under the further condition that the tests be supervised by competent veterinarians. The demand steadily increased until during the 12-month period ending June 1906, 103,510 doses were prepared and distributed.

Soon after the Bureau began to prepare tuberculin, chemical studies were made on it and the tubercle bacillus. A series of papers resulted which treated with many aspects pertaining to the organism itself and the diagnostic agent. Outstanding results of these studies included the discovery by Theobald Smith in 1895 that there are two different types of tubercle bacilli, human and bovine, affecting animals. Koch questioned the possibility of the bovine type affecting human beings, after which a number of investigations regarding the different types were carried out by many workers, including Dorset, Cotton, Mohler and McBride. According to Salmon, who was then chief of the Bureau, the most important result of these investigations was the finding that some tubercle bacilli isolated from man could produce tuberculosis in cattle and the further demonstration that virulent organisms isolated from children possessed morphological and cultural characteristics similar to those of the bovine organism.

With increased use of tuberculin, there was demonstrated the alarming extent to which cattle were infected. Russell, in 1906, reported that of 850 cattle contained in 70 herds, which were tested in 1903 and 1904, 50% were infected with tuberculosis. Infections ranging from 50% to 100% were reported in herds in many other states. There followed activities to determine whether or not it was possible to test herds with tuberculin and then free them from the disease. Results, particularly in the District of Columbia, indicated that by the use of this agent, eradication could be accomplished. In 1910, 1,701 cattle tested in the District indicated an infection rate of 18.87%, but by 1917, this figure had been reduced to 0.84% of 1,060 cattle tested. By 1918, the over-all infection rate was placed at 4.9%.

Further expansion of tuberculin testing resulted in drawing up an agreement for testing and eradication and subsequent accreditation. The original agreements provided for identification of animals tested, identification and slaughter of reactors, and cleaning and disinfecting the premises. The dairy herd known as the Ford and Graham herd, Garrett Park, Md., was the first in the United States to be accredited under a definite plan. However, the first herd accredited under the current plan, Uniform Methods and Rules for Tuberculosis-free Accredited Herds, approved December 1917, was the United States Soldiers' Home herd at Washington, D. C. That herd received certificate no. 1 on February 6, 1918. This herd has been dispersed during the past year.

The speaker brought out in chronological order, developments and progress of tuberculin testing through the stages beginning when the only official test was the subcutaneous, up to the present perfection of the intradermal tuberculin produced on synthetic media. The story is that of step-by-step progress and improvements as factors relating to the disease as it occurs in cattle, and to the laboratory observations on the growth of bacteria, were studied.

The work begun in the 1890's on the production of a suitable diagnostic agent is being continued. The no-visible-lesion reactor continues to present somewhat of a problem. Specificity of the diagnostic agent is a primary concern.

POSTMORTEM AND LABORATORY DIAGNOSIS OF BOVINE GRANULOMAS WITH SPECIAL REFERENCE TO TUBERCULOSIS

Abstract of a paper presented by C. L. Davis, D.V.M., and Wayne A. Anderson, D.V.M., M.S., Branch Pathological Laboratory of the Bureau of Animal Industry, Denver, Colorado.

Because of the macroscopic similarity of other chronic granulomatous lesions in the bovine to those of tuberculosis, it has been shown by laboratory studies that a diagnosis of tuberculosis, based on the gross appearance of lesions alone, cannot always be made. Laboratory examination of 108 cases, submitted with a postmortem diagnosis of suspected tuberculosis originating from both reactor and non-reactor cattle, showed 56, or 51.8%, to be tuberculous; whereas 52, or 48.2%, of the cases were found to be other granulomatous conditions. These chronic conditions with which tuberculosis may be confused are actinobacillosis, actinomycosis, coccidiogranuloma, other mycoses, and *Corynebacterium pyogenes* infection.

Tuberculin tests, conducted on herds on the basis of postmortem diagnosis alone, have in some instances failed to disclose any reactors. This has caused no little concern to ranchers, state and federal livestock sanitary officials, and others who are cooperating in the tuberculosis eradication program. The identification of animals, which on routine slaughter show lesions of suspected tuberculosis, confirmed by laboratory examination, has in the past uncov-

ered new foci of tuberculosis in unsuspected herds and will continue to do so. This cooperative procedure between the meat inspection service and the Pathological Division of the U. S. Bureau of Animal Industry constitutes a valuable adjunct to the Tuberculosis Eradication Division's program.

REPORT OF THE FEDERAL-STATE COOPERATIVE TUBERCULOSIS ERADICATION PROJECT

Abstract of paper presented by Asa Winter, D.V.M., assistant-in-charge of the Brucellosis and Tuberculosis Eradication Division, Bureau of Animal Industry, Washington, D. C.

The revived interest in tuberculosis eradication, which dates from the action taken by the U.S.L.S.A. in 1949, gives promise of an eventual eradication of bovine tuberculosis. Records of the work conducted during the past year and made available at this meeting by means of an assemblage of statistical matter, reflect an awakened attitude on the part of the industry and regulatory officials. Testing by states during the fiscal year 1951 totaled 503,933 herds. This included 8,847,228 cattle, of which 12,353 (an all-time low) or 0.14% were reactors. This approximates a 30% reduction from the 0.19% incidence reported for each of the past three years.

During recent years, many persons concerned have felt that the infection rate of approximately 0.2% was an irreducible minimum of bovine tuberculosis. Authorities have been pointing out that there have been uncovered annually too many herd foci of infection which, if undetected or uncontrolled, could mean doom for the eradication project, in which much time and money has already been invested. From observations, it is believed that the controversy during 1949 over the merits of the proposed six-year testing requirement served to alert the livestock industry and the veterinary profession to the real potentials of the bovine tuberculosis problem.

As an aid to the project, a form has been devised which is proving helpful in bringing to light more sources of infection than hitherto. Under the present plan the meat inspector at slaughter establishments is responsible for reporting the case back to the field and is, in turn, furnished with a report of the field research and herd testing which results from disclosure of the infected case. There is reason to believe a reporting system of this type, if given benefit of proper animal identification, could be the means of locating the majority of the field sources of infection. If reaccreditation of the lately infected areas is to be continued on the basis of percentage testing, the effective reporting of slaughter cases must be a requirement.

The speaker emphasized this matter and referred to results of a test which revealed 74 tuberculous reactors in one of the southern states which had protested the requirement of complete area testing. These infected animals represented more reactors than the entire previous year's total in that particular state. Efforts for improved identification and recording of slaughter animals are continuing.

In looking over the statistical tables presented, it is interesting to observe that six states, including California, Minnesota, Wisconsin, Illinois, Ohio, and New York, accounted for more than half of the testing done this year. These six states, which are representative of the dairy areas, report an infection rate averaging 0.15%, as against 0.14% for the country. This is a very close relationship and indicative of a successful effort to eradicate tuberculosis from the dairy branch of the livestock industry, commonly considered especially vulnerable to the disease. Several states having a large cattle population and which report the highest incidence of infection are doing far too little testing. It is the expressed hope that these states will give honest study to their own status and profit by the experience of others where in the past the disease has been given an opportunity to re-establish itself.

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The capital of the loan fund, sponsored by the Auxiliary to the Missouri Veterinary Medical Association, was substantially increased during the past year. Named the Jean Durant Loan Fund, in honor of the late Mrs. Adrain Durant, it offers financial assistance to qualified veterinary students of the Missouri school at Columbia.

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According to an Associated Press release dated November 20, 1951, foot-and-mouth disease was responsible for the loss of 2,000 head of cattle, sheep and pigs in Switzerland during the preceding four-week period. The outbreak is reported by Swiss authorities to be the most severe since that of 1938.

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An analysis of various teaching technics used for instructing large groups of Army reservists led to the conclusion that the best method was narrative combined with drama or film that defined and amplified what the narrator was talking about.

Committee Reports

PRELIMINARY REPORT OF THE NATIONAL COMMITTEE ON ERADICATION OF HOG CHOLERA

Report presented by L. M. Hutchings, D.V.M., M.S., Ph.D., Purdue University, Lafayette, Indiana, chairman.

At the outset, the Committee wishes to emphasize that it believes eradication of hog cholera possible; but not while mass production and field use of virulent hog cholera virus is permitted. This statement is in accord with that of the National Research Council report. It is suggested that as soon as nonvirulent cholera immunizing agents have been approved fully by the U. S. Bureau of Animal Industry, livestock sanitary officials, and representatives of the swine industry, and have demonstrated through actual farm use that they are thoroughly effective immunizing agents, steps should be taken to cease renewal of licenses for production of virulent hog cholera virus. In this interim, any state should be permitted to limit or forbid the use of virulent field virus if it sees fit to do so. The Committee suggests that until field use of virulent hog cholera virus can be eliminated, the following measures bearing on better control of hog cholera should be approved and activated.

Recommended Interim Procedures

A. Legislation. (1) It is recognized that virulent, live hog cholera virus is employed in immunization procedures and moved interstate in an indiscriminate manner. Wherever such products are employed, potential centers of infection are established. If, therefore, hog cholera is to be controlled or eradicated, the distribution and use of virulent, live hog cholera virus must be controlled. To accomplish this, the Committee recommends the consideration of adopting and activating Amendment 15, to BAI Order 276, as originally promulgated by Secretary of Agriculture, Claude R. Wickard, in 1940. This amendment provided that manufacturers of hog cholera virus make a report of the name of the person to whom the product was shipped interstate and that this information be forwarded to the chief regulatory official of the state to which shipment was made.

(2) It is suggested that those states having inadequate legislation governing the control and use of the virulent, live hog cholera virus be encouraged to suggest legislation to provide such adequate control; that the BAI give all possible guidance and cooperation to respective state livestock sanitary authorities in suggesting revisions of existent laws and regulations governing prevention and control of hog cholera;

Dr. L. M. Hutchings

and further, that the United States Livestock Sanitary Association endorse and urge consideration of revision of existent laws and regulations where such action is indicated. (Model legislation may be provided by committees of the U.S.L.S.A.)

B. Sanitary Recommendations. (1) It is recommended that on premises where hog cholera exists (either as a natural field infection or as a result of vaccination overreaction), closed quarantines shall be instituted and shall be subject to release by the chief livestock sanitary official.

(2) All veterinarians, or other persons having hogs under their control or supervision and knowledge of or reasonable suspicion of hog cholera, shall render an immediate report to the state livestock sanitary official, setting forth the name and location of the premises. Suitable penalties should be established to enforce such reporting.

(3) No garbage, not sterilized by heating, except that originating on the premises where it is fed, shall be fed to swine. Owners should be advised to avoid feeding uncooked home garbage because of the danger of spreading hog cholera.

(4) All carcasses of swine which have died of hog cholera shall be disposed of by licensed

rendering plants, burning under quarantine supervision, or deep burial with lime.

C. Recommendations for Use of Immunizing Agents. (1) It is recommended that all swine of any age (except suckling pigs nursing sows vaccinated against hog cholera prior to farrowing) transported for the purpose of sale, barter, exchange, or exhibition, except for immediate slaughter, production of biologics and experimentation, shall meet one of the following requirements: (a) They shall be accompanied by an official certificate of vaccination with the serum-virus method more than 30 days prior to sale, or (b) vaccination with nonvirulent vaccine within the immunizing limitations of the product.

(2) It is suggested that the same requirements shall apply to the transportation of swine sold on the premises of the owner after such sale as apply to swine transported for sale, barter, trade or exhibitions.

(3) It is further recommended, that when feasible for recognized government officials, state and national, the licenses of all plants to produce virulent hog cholera virus for field use shall be terminated. At the time of termination of such licenses provisions should be made to permit production of hog cholera virus for purposes of antiserum and vaccine production.

(4) Widespread field use of non-virulent hog cholera vaccines should be encouraged as an adjunct to official control programs. However, provisions for adequate supplies of existing products should be made until there is proof available of the value of the vaccines.

D. Research Recommendations. The Committee suggests that all segments of the swine industry concur in sponsoring adequately financed research bearing on all phases of the epidemiology of hog cholera. Such research should include comprehensive and conclusive laboratory and field testing of vaccines and other types of immunizing agents by an independent research institute or institutes. In order to implement this suggestion, it is recommended that the Research and Marketing Act Livestock Advisory Committee be urged to plan, or cause to be planned projects and adequate funds to carry on this important work.

E. Revision of Procedures. It is suggested that as new information becomes available and new products are licensed, the interim procedures suggested herein should be modified to meet the situation. Furthermore, the sanitary measures recommended should be completely modified at the time virulent virus usage in the field is discontinued.

Recommendations for Public Relations

Inasmuch as more than sufficient scientific knowledge is already available, the Committee has proceeded on the thesis that one of its assignments was to outline an educational and public relations procedure for the total eradication of hog cholera; assuming that the technical, legal, and organizational means for such eradication are now available or will be at some future date, and that the public support for such eradication can be generated and mobilized.

Stated in the most simple terms, the problem is one of disseminating as widely as possible among producers, handlers, distributors, processors and perhaps even consumers, the basic facts about hog cholera and its eradication, to-wit: the nature of the disease, losses and evils, possible methods, benefits and advantages of such eradication.

While these are the essential and simple elements of the problem, the magnitude of the educational and public relations job is apparent. It has been pointed out that hog cholera is the one and only disease with which the reverse philosophy has been practiced, of living with it rather than striving to eliminate it, as has been the practice with all others which have threatened the livestock industry. Hence, if cholera is to be eradicated the task of reversing our thinking, toleration, national and state policy, and past action with respect to the disease, must be entered upon.

Furthermore, it must be done without the advantage of public health appeal, such as proved so potent in the case of tuberculosis eradication. There is, of course, the appeal of a higher quality and a more stabilized supply of pork and pork products in a hog cholera eradication campaign, but these benefits cannot be dramatized in terms of babies, mothers and protection of the home.

Public support and action on hog cholera eradication must be mobilized on the basis of the shameful economic loss now being suffered by farmers and the nation, on the staggering cost of trying to control the disease while still temporizing and tolerating, on the anxiety latent in the hearts and minds of farmers as a result of the threat which hog cholera constantly holds over their heads, on the pride of producers in good husbandry, and on the economic benefits which will accrue to the entire livestock industry in the form of reduced costs, the elimination of waste and losses, and the production of a higher quality product.

While this poses a gigantic task, we are encouraged by the credo of Dr. B. T. Simms,

Chief of the U. S. BAI and a member of the general committee, that, "Animal disease control and eradication are a condition of the mind." The clear inference and challenge of this statement is that, with the proper technical, legal and organizational means at hand, hog cholera can be eradicated in the United States if farmers, producers, and all other interests of the industry are made so minded through an effective educational program.

To this end, the Committee recommends that a Public Relations Committee on the Eradication of Hog Cholera be set up by the U. S. Livestock Sanitary Association to organize and coordinate materials, manpower and methods at the national level. This might preferably be a subcommittee of a larger committee, but in any event, its work should be closely integrated and coordinated with the activities of other U.S.L.S.A. committees concerned with eradication procedures.

It is further recommended that the state livestock sanitary officials in each and all of the states appoint a public relations committee on hog cholera eradication to cooperate with the national committee and to organize, coordinate and localize the educational phases of the campaign at the state level.

The organization of such committees is further recommended on the county level, at least in the important commercial hog-producing counties of the nation.

It is recommended that the membership of these committees at the national, state and county levels include representatives of such groups as the Extension Service, veterinarians, swine breed associations, commercial hog producers, farm organizations, livestock haulers, packers, farm press, daily and weekly press, radio and any others with a stake or an interest in the problem.

Basic materials with which these committees will work in furthering the educational and public relations program are the new facts on hog cholera eradication as developed by state and federal agencies, private industry and farmers and producers themselves, supplemented, of course, by the basic knowledge on hog cholera. There also will be important material issuing out of the work of the various committees concerned with various phases of the problem.

As a means of unifying and coordinating available subject matter on the problem of hog cholera and of bringing all of it to bear in the most effective manner on the campaign, the Committee recommends that a group of competent authorities be appointed to assemble and publish under the sponsorship of the U.S.L.S.A., a popular type booklet of facts about hog cholera, its control and eventual eradication. Such a booklet might take the form of the one entitled, What Is Known About Brucellosis.

As of today, such a booklet might not be able to spell out all the details of a campaign to eradicate hog cholera, but it should, among other things, present the pros and cons in the most effective manner possible in order to expedite the campaign once it is under way.

It is further recommended, that the U. S. Department of Agriculture, the Federal Extension Service, state experiment stations and state extension services be asked to review their current bulletins, circulars and other publications dealing with hog cholera to the end that these may be updated and modernized wherever necessary in order to make them more effective instruments in the eventual extermination of the disease.

It is the feeling of the Committee that much of current public information on cholera, its control and eradication, is ineffective because of faulty distribution, or because it is not getting into the proper hands. Therefore, it is recommended that one of the functions of the subcommittee on public relations suggested be to serve as a clearing house for all current press material and publications on hog cholera and that this committee do everything possible to see that meritorious and helpful material receives proper distribution and attention wherever it might be used to advantage in furthering the campaign.

As a source of helpful and effective material, especially during the early stages of the campaign, the Committee recommends that the proper authorities consider launching the eradication effort in a pilot-test area. At one time this was, and may still be, the considered judgment and the suggestion of the BAI. Such an area could be an effective "laboratory" for ridding the campaign procedure of troublesome "bugs" before the nation-wide program is launched. More important, if such an area were properly organized and handled, it could serve as an invaluable source of pictures, as well as articles and press material, which could be used to good advantage in presenting to the remainder of the country the procedures, the problems, and the benefits of eradication.

BUY CHRISTMAS SEALS

BRUCELLOSIS

Notes of a report presented by H. G. Geyer, D.V.M., Ohio State Veterinarian, Columbus, chairman.

Each year for the past 36 years, the U. S. Livestock Sanitary Association has appointed a committee on brucellosis. These committees have been charged with the responsibility of securing and making available for the benefit of the livestock industry factual information relative to the disease, as well as offering recommendations for its control and eventual eradication. Progress has been slow, but it is gratifying to observe that the national incidence of the disease is declining. Furthermore, the fact that three states have now attained the enviable Modified Certified Brucellosis-Free status should be a stimulus to future committees in furthering the work.

In the past, emphasis has been placed on the consideration of this disease as it occurs in cattle. Recent investigations have indicated the need for additional information on brucellosis in swine and goats and possibly other species that might be implicated in transmission to cattle. Certainly these other species must be considered in order to attain eradication of the disease.

Favorable reports as they relate to the efficiency and economy of the milk test indicate that it well may be recognized and employed on an even wider scale, particularly in area control work. This test has the advantage of being easily conducted, inexpensive and practical since it may be employed monthly or even more frequently if deemed advisable. It has aided materially in control efforts, but intensified investigations are necessary to improve further diagnostic methods. The same may be said for immunizing agents.

The farm press is to be particularly commended for its efforts in bringing factual information to livestock producers and the general public. It is considered that the accounts published in these journals have improved basic understanding and have paved the way for greater accomplishments. The continuation of this educational program is recommended as being vital to eventual eradication.

The Committee recommended that funds appropriated for brucellosis control be used in order of the following priorities: (1) state-wide milk and blood testing of all dairy herds, (2) informative blood testing, (3) calfhood vaccination, and (4) indemnities.

It was also recommended that certificates of health made on individual animals indicate the brucellosis status of the herd of origin. This recommendation applies to both cattle and swine.

The new U. S. Public Health Standard Ordinance and Code for milk is expected to be issued next year. It is understood that one of the provisions of this new ordinance is to require that within a period not to exceed three years after adoption all herds producing milk for pasteurization must be operating under Plan A or B for brucellosis eradication. It is the opinion of this committee that the three-year interval is too short. A five-year period for compliance is recommended.

Problems in relation to brucellosis control on ranges and in range areas have posed major questions since general rules adopted were difficult to apply in these areas. It was recommended that the incoming chairman of the Committee be instructed to appoint a subcommittee of ranchers and regulatory officials to draw up rules and regulations having such specific application.

Also, recommendations were made revising those made by the U.S.L.S.A. in 1949 for brucellosis eradication as they relate to the identification of vaccinated animals: (1) All vaccinated adult animals shall either be tattooed "AV" in the right ear or branded "AV" on the right jaw. (2) All vaccinated calves shall either be tattooed "V" in the right ear or branded "V" on the right jaw. If a tattoo is used, then the "V" shall be preceded by the numeral indicating the quarter of the year, and followed by the last number of the year in which vaccination was done. Example: "IV2" would indicate that the calf was vaccinated in the first quarter, 1952. If the brand is used, then the "V" shall be applied in four different positions; one each year over a four-year period to indicate in which year the vaccination was done. The fifth year will repeat the first year and so on indefinitely. In 1952, the "V" shall be placed with the open end up; in 1953, with the open end facing to the right, and so on clockwise indefinitely.

Detailed proposed revisions of Uniform Methods and Rules for Establishment and Maintenance of Certified Brucellosis-Free Herds of Cattle and Modified Accredited Areas both as they pertain to the Individual Certified Herd Plan and the Modified Certified Area Plan were presented. These will be published in detail in the proceedings of the annual meeting.

The technicolor film, Triple Threat of Brucellosis, enjoys enthusiastic reception by many lay groups.

THE IMPORTANCE OF INSPECTION OF POULTRY AND POULTRY PRODUCTS TO THE CONSUMING PUBLIC

Abstract of an address by H. J. Stafseth, D.V.M., Department of Bacteriology and Public Health, Michigan State College, East Lansing, Michigan.

There is no valid reason why poultry should be marketed under less stringent regulations than those covering other meat food products. In fact, there is ample evidence to support the necessity for well regulated and professionally supervised inspection of meat products derived from poultry. In 1950, 28% of the reported cases of food poisoning in the United States originated from poultry.

The Production and Marketing Administration of the USDA continues to grade-label birds that have not been inspected. There is no justification for continuing such deceptive practice.

The intention for grading any food product is to serve the best interests of the consumer. This is certain to benefit the producer and distributor by the creation of confidence in the quality of standardized products on which the consumer can depend.

Under the present system, birds are graded solely on the basis of flesh, fat and finish, without providing a method of determining the state of health of individual carcasses. Therefore, Grade A poultry products that bear the official shield and give an illusion of protection may come from diseased birds. Disregarding public health significance of this practice, such a system is certain to influence downward the demand for poultry meat and thus be harmful to producer and distributor. The excellent work of extension specialists, federal, state and industrial personnel, which has resulted in phenomenal expansion of the poultry industry until it now ranks among the first of all our agricultural pursuits in economic importance, is being undone. To be honest, a statement on grade labels applied to uninspected poultry should read: "Buy and consume at your own risk."

Responsibility for inspection of poultry and poultry products should be vested in the BAI because of the experience and organization of this agency to work effectively and economically. Furthermore, only the Bureau of Animal Industry is properly staffed with qualified personnel to enlarge on any program of sanitation and inspection. It is recognized that much of the actual service will be rendered by lay inspectors and these, properly trained and supervised, can provide service essential to public acceptance and demand for a wholesome product.

The marketing of dressed poultry, not eviscerated, is considered to be a most undesirable practice and should be discontinued. The time is long overdue when the consumer should be made to realize the utter stupidity of buying a lot of more or less offensive waste material along with a food item. No other foods are purchased under like circumstances.

REPORT OF THE COMMITTEE ON MORBIDITY AND MORTALITY STATISTICS

Notes of a report prepared by C. R. Schroeder, D.V.M., Pearl River, New York, chairman.

For more than 30 years, the U.S.L.S.A. has urged state and federal livestock officials to give consideration to perfection of a system of collection of vital statistics concerning animal diseases. Such statistics would make available information useful to practitioners and others interested in the incidence of specific diseases and the control of those communicable to man.

The need for a central agency was voiced by Dr. D. M. Campbell, a member of this committee, before the annual meeting in 1920. The necessity for statistical knowledge was pointed out at that time, as was the fact that without dependable records of what illnesses occur among the human population, public health agencies are handicapped. In spite of the efforts of many other committees, this one is still concerned with publicizing the need for animal morbidity statistics.

The need is perhaps made more apparent by statistics gathered in a few specific disease control projects. Their value has been demonstrated; the tuberculosis-free herd plan being an outstanding example. Recently published data on the incidence of rabies and anthrax illustrate trends adding strength to efforts of practitioners and disease control officials.

As reported last year, the 81st Congress, though it had no lack of voiced approval by groups representing a cross-section of the entire livestock industry, failed to make the necessary appropriation for a central agency, within the structure of the BAI, to handle this matter.

During the past year, the Committee requested information from all state and territorial veterinarians, from which it was hoped to accumulate informative data for the annual report. There were only 28 replies to the questionnaire, many incomplete. Most states supplied a list of reportable diseases, forms in use or proposed, and other information, indicating that the machinery is available for state-wide

assembly of material but that it fails to function.

Conviction was expressed that if a state reporting system materializes, a federal program, including a special central agency for assembling and analyzing state reports, will not lag far behind.

REPORT OF THE COMMITTEE ON PARASITIC DISEASES

Notes of a report prepared by Benjamin Schwartz, Ph.D., Washington, D. C., chairman.

The report of the Committee this year was devoted entirely to consideration of the internal parasites of swine. Emphasis was placed on the economic aspects of parasitism in this species of animals due to the insidious nature of such infections.

Available facts relative to the effect of some individual species on weight gains were summarized. The pathogenicity of infection and life cycle of the intestinal threadworm, *Strongyloides ransomi;* whipworms, *Trichuris suis;* stomach worms, *Hyostrongylus rubidus;* nodular worms, *Oesophagostomum* sp.; kidney worms, *Stephanurus dentatus,* and ascarids, *Ascaris lumbricoides,* were outlined. Investigations were cited of controlled experiments designed to reveal the effect of definite parasite loads on growth and weight gain. This research involved experimental infections at various levels and observing factors relating to growth and weight gains, as compared to non-infected litter mates on identical rations.

This depression in weight gains, due exclusively to parasitic loads, clearly emphasizes the cost of parasites in terms of meat production. Comparisons are not possible on farms so that growers are not impressed with damages attributed to worms of various species. Pigs heavily infected with whipworms, as an example, gained only 57% as much weight as did lightly infected animals. Likewise, all parasites mentioned in the report depressed gains in weight of their hosts in reverse proportion to their numbers as determined by count at autopsy.

In the case of whipworms, suggestion was made that breeding capacity of infected females might be impaired.

Pigs that harbored more than 500 stomach worms died. Heavy infection of nodular worms destroyed the health of a pig to the extent that a continual loss of weight occurred and in some cases was responsible for death. Recent surveys indicate widespread kidney worm infection in swine in a zone extending from the former known infected area in the South to Corn Belt farms. Migrating larvae of these parasites are responsible for much tissue damage, particularly in the liver. Extensive trimming and frequent condemnation of this organ for food due to invasion of kidney worms is increasing.

According to federal meat inspection records, about 8% of the total number of swine carcasses condemned are "sent to the tank" because of icterus. A majority of such cases are associated with occlusion of the bile ducts by ascarids.

Lungworms have been implicated in the transmission of swine influenza in addition to their effect in retarding growth. These illustrations are a few of the manifold ways in which swine parasites may become potential enemies of thriftiness.

There remain many unknowns in regard to swine parasites. The report points out deficiencies in our knowledge of the effect of various nutritive elements on host resistance. The complex immunological relationship between parasites and their definitive host has received too little attention. Little information is available on the possible role of parasites in the transmission of diseases.

Treatment methods to relieve swine of their parasitic loads is satisfactory only in the case of ascarids. Some others are beyond reach of presently known anthelmintics. Other control measures are short of ideal or are impractical or otherwise unacceptable to swine growers. Selection and development of strains of swine that will either resist parasite infection or possess a tolerance for them is a suggested need.

FOOT-AND-MOUTH DISEASE

This committee's report referred to the epizootic proportions of foot-and-mouth disease in South America and in Western European countries.

The types of disease virus existent complicate control. Newly recognized variants now challenge efficacy of vaccination. These observations, with other uncertainties relating to vaccine used in Mexico, have influenced the Committee to recommend eradication by slaughter and strict quarantine as the only dependable means of control in case of outbreak in this country, except under extreme, and now unforeseen, economic aspects.

The United States should not be dependent upon diagnostic facilities abroad. Construction of a suitable laboratory for the study of foreign disease plagues was recommended.

REPORT OF THE COMMITTEE ON BIOLOGICALS AND PHARMACEUTICALS

Notes of a report presented by H. E. Biester, D.V.M., Veterinary Research Institute, Iowa State College, Ames, Iowa, chairman.

Two new products have been licensed since the report of this committee last year:

1. Anticanine distemper and anti-infectious canine hepatitis serum.

2. Hog cholera vaccine, modified live virus.

The second of these new biological products includes two types of vaccine. One is of rabbit origin and the other of swine origin. Final evaluation of these under field conditions remains to be accomplished.

Far-reaching effects of recent developments and activities pertaining to hog cholera are of grave nature. The facts are that little is known regarding the virus of this disease and that research must be intensified and coordinated. Final solution of the problem of control or eradication must rest upon more basic information pertaining to hog cholera as a disease and on a better understanding of the causative virus. It is reasonable to conjecture that the failures in the simultaneous method of immunization are based upon the same unknowns that characterize the failures in recently introduced methods.

The Committee decried evaluations of new vaccines by lay journalists. Technical presentations on the subject in veterinary publications are conspicuous by their near absence. Professional standards are jeopardized when journalistic efforts are substituted for critical testing and evaluation by persons specifically trained and experienced in field and laboratory research. Those best acquainted with the problem of this number one killer of swine readily concede that the simultaneous method of preventive vaccination is imperfect, but it must also be recognized that this disease control measure has made possible tremendous expansion of the hog industry which has assured growers just profits from swine breeding and feeding operations for four decades. For this, if for no other reason, caution should be exercised in the use of new products until unknowns regarding them are brought to light.

Few persons appreciate fully activities of the Food and Drug Administration in protecting livestock growers from exploitation by vendors of nostrums. More than 16 violations pertaining to veterinary products were prosecuted during the past fiscal year. More controlled experiments are needed to establish evidence to halt claims for materials of doubtful value. No successful prosecution is possible without data assembled from such experiments. This committee urged workers who have experimental data of significance available, to report findings in literature and thus support efforts of regulatory officials.

RABIES IN THE UNITED STATES

Notes of a report presented by L. E. Starr, D.V.M., M.S., Ph.D., public health veterinarian, State Department of Public Health, Atlanta, Georgia.

With the report submitted, this committee attached the report of incidence of rabies for the calendar year 1950. These statistics were compiled from a questionnaire sent to each state official by the Bureau of Animal Industry, USDA.

There were 7,910 cases reported. Of these 4,979 were dogs, 948 cattle, 33 horses, 48 sheep, 85 swine, 428 cats, 5 goats, 1,375 miscellaneous species, and nine human cases. Reported cases, as listed, probably do not represent all that occurred.

Preliminary surveys indicated that there were fewer cases of the disease during 1951 than reported for the previous year. Little encouragement can be taken from this in view of the fact that areas free of rabies for years have reported extensive outbreaks during the past 12 months.

The U.S.L.S.A., at its 1947 annual meeting, approved the report of the Conference on Rabies held in Philadelphia in April of that year. It was recommended that the BAI also be given authority to engage in a national control program and that this organization, with the U. S. Public Health Service and the Fish and Wildlife Service, function cooperatively in such program. The U.S.L.S.A. took action at its 54th annual meeting in Phoenix by resolution, petitioning the Secretary of Agriculture to secure such authority from Congress. The reporting Committee presented a draft of a bill to amend the present act and allow the BAI to take its place in a national rabies control program, and recommended that it be introduced by its Legislative Committee and be actively supported by the Association.

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Meat production under federal inspection for the week ending November 10, 1951, was estimated at 396,000,000 lb., according to the USDA. This was an increase of 8% above the previous week and 19% more than that produced a year ago.

TRANSMISSIBLE DISEASES OF POULTRY

Notes of a report presented by H. Van Roekel, D.V.M., Ph.D., Department of Veterinary Science, University of Massachusetts, Amherst, chairman.

Transmissible diseases of poultry constitute major limiting factors to profitable poultry production. Expansion of the industry during the past decade adds emphasis to the importance of protection of the health of this segment of agricultural pursuit. Future expansion will be possible only if veterinarians, laboratory diagnosticians and research workers give deserving attention to matters pertaining to diseases to which this class of stock is subject.

In assessing the present status of pullorum disease, the Committee reported continued progress toward reducing the incidence of this malady under the National Poultry and Turkey Improvement Plans. Percentage of reactors on official testing has been reduced from 1.79% in 1946 to 0.55% in 1950 for chickens, and from 1.21% to 0.35% during the same period for turkeys.

Re-emphasized in the report was the still obvious need for sound sanitary practices for the control of diseases on poultry farms. The problem of coccidiosis, measurably reduced by widespread prophylactic use of newer compounds, continues to plague some flocks. These apparent failures should be investigated thoroughly to determine if other intestinal disorders are concurrent and are causing deaths, or if losses represent actual failure of compounds used.

Largest losses among adult poultry are due to the avian leukosis complex. In the United States, an annual loss in excess of $60,000,000. is attributed to visceral and neural lymphomatosis. Ocular manifestations of this disease complex are less often observed than formerly. Breeding for specific disease resistance or raising birds in complete isolation are the only known methods of control.

▼ ▼ ▼

The Committee on Infectious Diseases of Cattle, with Dr. H. U. Garrett, state veterinarian of Iowa, acting as chairman, reported that in answer to a questionnaire directed to state livestock sanitary officials, 42 of the 45 states returning the report stated that mastitis is a problem in their respective states. The incidence was reported from very low to as high as 50 to 60% of dairy cattle. This committee recommended that a special committee on mastitis be appointed for the ensuing year.

ADVISORY COMMITTEE ON ANAPLASMOSIS

Notes of a report presented by H. Schmidt, D.V.M., Texas Agricultural Experiment Station, College Station, chairman.

In areas where anaplasmosis is present in cattle, it ranks at the top of the list of diseases which give concern to stockmen. In new areas in which incidence of the disease has been reported recently, it is creating even more concern because of the dangers incident to the failure to recognize the infection.

The key to the problem of control is still the carrier animal. Such animals cannot be detected by any simple or reliable test which is easily applicable. Some laudable progress has been made in the development of the complement fixation test, but it still leaves too many carriers not detected. More work on the problem is needed and more information on its shortcomings must be made available if successful control procedures are to be established.

No therapeutic agent tested to date has given promise of being effective. One such agent proposed in the literature and reported to be giving favorable results was found completely worthless in trials at the Texas station. In the meantime, more reports are available that massive blood transfusions in the treatment of acute cases is the best therapeutic measure available at this time.

NOTES ON FOWL PEST

Outbreaks of fowl pest in America always have been controlled by measures directed at eradication of infected birds and disinfection and other methods to prevent the spread of infection. This disease has been mentioned as a potential weapon in the advent of biological warfare.

The disease appears with suddenness and is characterized by loss of appetite, deep somnolence, swelling of the head, and cyanosis. Differential diagnosis should be made of birds exhibiting these symptoms so that prompt control measures can be taken. Past experience indicates that this Old World plague is self-limiting. Spontaneous disappearance has been the rule because of its devastating nature and the fact that the causative virus is rapidly rendered innocuous except under conditions most favorable to its existence.

Federal disease restrictions were first applied to poultry during the 1924-25 outbreak of fowl pest. The successful eradication was considered a noteworthy achievement by federal and state officials concerned, even though it was a costly one.

Continuous Phenothiazine Therapy for Horses

IV. The Third Year of Treatment†

A. C. TODD,* Ph.D., Lexington, Kentucky

AN experiment designed to determine the effect of continuous low-level phenothiazine therapy on the physical well-being of horses and on their strongyle parasites was begun at this station in late April 1948. The test originally included 12 horses which ranged in age from two to 18 years, and which were divided into four groups and fed 0.5 gm., 1 gm., 2 gm., and 4 gm. phenothiazine, respectively, on their grain ration at daily intervals. At the end of the first year of treatment one horse in each group was sacrificed and given complete postmortem examination[1,2]. The eight remaining horses were continued in the same groupings and fed the above dosages of phenothiazine for a second year. At the end of the second full year of treatment one horse in each group was again sacrificed and given complete postmortem examination[3]. At the close of the first two years of treatment no harmful effect of the continuous therapy had been discovered; numbers of strongyles carried by the horses had been significantly reduced.

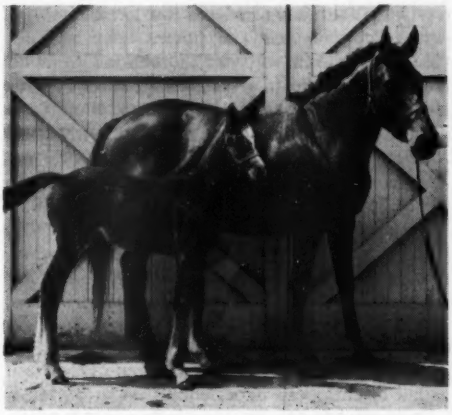
In the third full year of continuous treatment each of the four remaining horses was fed 2 gm. phenothiazine daily on its grain ration. The horses were not sacrificed at the completion of the third year but are being held in order to continue daily treatment for the rest of their lives at this department. The present report contains the data obtained from the egg counts made at four-week intervals in the third year of treatment together with notes on the appearance and behavior of the horses. Methods and technics used in the study have been presented in detail in the previous reports[1,2,3].

†The investigation reported in this paper is in connection with a project of the Kentucky Agricultural Experiment Station and is published by permission of the director.

*Department of Animal Pathology, Kentucky Agricultural Experiment Station, Lexington.

Observational Data

The complete record of strongyle egg counts obtained from each of the four horses is given in table 1.



A six-year-old mare that received 2 gm. of phenothiazine on her grain feeding daily for three years. This mare was successfully bred and foaled normally in the spring of 1950 and 1951.

The seven-year-old mare passing 144 eggs per gram on May 17, 1950, had been fed 0.5 gm. phenothiazine daily for the first two years of the test. Her subsequent counts on 2 gm. daily show an almost complete disappearance of strongyle infections. The five-year-old mare had been fed 1 gm. phenothiazine daily for the first two years of the test. Her strongyle infection was well controlled in the third year. The six-year-old mare received 2 gm. of phenothiazine daily for the two previous, and the third, years of treatment. Her strongyle egg record is the poorest of the four horses. The

TABLE 1. Worm Egg Counts of Horses Receiving Daily Low-Level Phenothiazine Therapy

Horse	Strongyle Eggs Per Gram of Feces at Examination on Dates Shown												
	5-17-50	6-16	7-13	8-12	9-12	10-10	11-8	12-4	1-3-51	1-29	2-28	3-28	4-25
7-year-old m.	144	16	0	0	32	16	0	16	0	16	0	0	0
5-year-old m.	0	0	0	0	0	0	32	0	0	16	0	16	0
6-year-old m.	32	0	0	0	64	48	32	16	48	48	0	0	32
11-year-old m.	0	0	0	0	0	0	0	0	0	0	0	0	0

11-year-old mare had been fed 4 gm. of phenothiazine for the first two years of treatment. No strongyle eggs were observed in any of her fecal samples. (Table 1.) Actually, this mare's fecal samples had been negative from October 10, 1949. The record obtained from the 11-year-old mare is considered evidence of the failure of a species of strongyle to develop an immunity to phenothiazine therapy which might be indicated in the record of the six-year-old mare.

It is again necessary to note that the test conducted at the Kentucky Experiment Station has proceeded under particularly fortunate circumstances. The three years of the test have not been marred by accidental injury to the horses. The horses have not developed bacterial or viral infections of such natures as would interfere with the test. Actually, each horse has remained in excellent condition. Each horse produced a normal, healthy foal in the spring of 1950. Each horse was successfully bred in the spring of 1950 and foaled in the spring of 1951, except for the 11-year-old mare whose pregnancy was not at full term by mid-May. The five-year-old mare's foal was a "sleeper foal" and died a few days after birth. Regular blood examinations of the four mares have not disclosed an hemolytic anemia due to phenothiazine therapy. The animals have remained alert and have displayed no inappetence.

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Periodicity of Microfilaria *(Dirofilaria immitis)*

Reference is made to comments by Dr. Gerry B. Schnelle, which appeared in VETERINARY MEDICINE for June 1951, page 211. These called attention to experience that indicated a pattern of periodicity. He infers that we discounted the possibility that variations in microfilaria count will occur in infected dogs when tested repeatedly over a 24 hour period.* Actually, experiments were directed toward developing a diagnostic procedure which would be highly sensitive and thus more accurate regardless of the hour of sampling.

In the past, many veterinarians have sampled suspected clinical cases late in the afternoon or early morning with the hope of demonstrating the parasite which had not been found following sampling during regular office hours. Our work indicated that this nocturnal sampling was not necessary when filtesting was used, because this technic was extremely sensitive even in known infected dogs having low microfilaria counts. This point of sensitivity is further substantiated by Doctor Schnelle's observation that we used sampling periods which he had demonstrated to be low points in the peripheral circulation of microfilaria in war dogs, *i.e.*, 8:30 a.m. and 3:30 p.m. Thus, even when infected dogs were sampled at the low periods of peripheral concentration, the filtesting technic was 100% accurate in 48 tests.

The following microfilaria counts were obtained on two infected dogs which were sampled at four-hour intervals to see if nocturnal sampling would have been justified. Attention is called to the consistent high filtest count in comparison to the whole blood count, regardless of the time of sampling.

	Dog No.	Whole Blood Count	Filtest Count
9:00 a.m.	4	2	92
	9	17	130
1:00 p.m.	4	5	45
	9	11	245
5:00 p.m.	4	7	85
	9	8	180
9:00 p.m.	4	3	173
	9	4	99
1:00 a.m.	4	1	162
	9	13	145
5:00 a.m.	4	6	57
	9	4	101
9:00 a.m.	4	11	89
	9	11	90

This limited study further substantiates the statement that as long as filtesting renders the veterinarian accurate diagnostic assistance during regular office hours, hourly variation of microfilaria count is of little practical significance.—*George R. Burch, D.V.M.*

*Burch, George R., and Blair, Harry E., A Rapid Test for the Diagnosis of *Dirofilaria immitis*. *Vet. Med.*, 46:128 (Apr.), 1951.

The Stability of *Erysipelothrix rhusiopathiae* Vaccine (Desiccated)

R. B. GOCHENOUR,* V.M.D., and E. S. YOTTER,* A.B., Indianapolis, Indiana

Following the successful use in Europe of the culture-serum method of immunizing swine against erysipelas, the use of *Erysipelothrix rhusiopathiae* vaccine was initiated in the United States in 1938. At that time, a cooperative state and federal project for control of swine erysipelas through the use of hyperimmune serum and living, pathogenic culture was inaugurated.

The initial American project was confined to a relatively small area, with provisions for supervision of immunization practices and the submission of accurate records and follow-up reports as a means of evaluating the safety and efficacy of the method. With increased evidence of safety and efficacy, additional states entered into the cooperative project. Twenty-three states now authorize the use of the culture vaccine.

Results of the first ten years of this program have been favorably reported by Peterman, Schoening, Beagle, and Grey[1].

In the initial five-year period, the Bureau of Animal Industry of the United States Department of Agriculture manufactured all culture vaccine used in the program. Because the liquid vaccine had poor keeping qualities, licenses later issued for its commercial production and distribution, prescribed an expiration date of 60 days from date of manufacture. Shortly thereafter, in March 1944, the dating period was reduced to 40 days.

Despite the fact that representative samples of each production lot are tested by the BAI, as well as by the manufacturer, for purity, viability, and virulence before release for marketing, it became evident that liquid *Ery. rhusiopathiae* vaccine was so unstable that no absolute guarantee of potency was possible. Van Es[2] tested 197 lots of liquid vaccine prepared by seven different manufacturers. Only 76% were found to be acceptable at the end of the dating period. It was thus apparent that a vaccine of greater stability was needed.

The preparation of a desiccated vaccine by drying the culture from the frozen state appeared to be a logical approach to the problem. A method of desiccation, generally similar to that used for desiccating *Brucella abortus*, was found to be very satisfactory for *Ery. rhusiopathiae*. Indeed, the latter withstood desiccation better than *Br. abortus*, and under optimum conditions there was no significant loss of viability whereas in the case of *Br. abortus*, up to 50% loss of viability could be expected; due solely to the process of desiccation. Preliminary studies also demonstrated the desiccated vaccine to possess exceptionally good keeping qualities. Tests on full scale production runs of vaccine made by this method confirmed these findings.

In evaluating the stability of a desiccated vaccine, three points must be considered. First, how does the drying process, itself, affect the vaccine? Second, how stable is the vaccine in the desiccated state? Third, is the vaccine reasonably stable after restoration to the liquid state? The viability and virulence tests employed by the BAI for liquid *Ery. rhusiopathiae* vaccine were used to answer these three questions.

Prior to desiccation, 317 lots of swine erysipelas vaccine were tested in the liquid state for viability and virulence. All were acceptable. Immediately after desiccation, samples of each lot were restored to the liquid state and again tested for viability and virulence. All lots were found to be of the same viability and virulence as prior to desiccation. In other words, the process of desiccation had had no deleterious effect on any of the vaccine so tested.

After two years had elapsed since 29 production lots of the vaccine were desiccated, one and one-half years for 85 lots, and one year for 147 lots, these 261 lots were retested. Each was found to be as viable and as virulent as it was prior to the time of desiccation.

Tests were also conducted to determine the stability of desiccated vaccine following restoration. Vaccine desiccated and stored for 12 months was restored to the liquid state and stored at 40 F. Tests of the viability and virulence of this restored vaccine were conducted 1, 2, 3, 4, and 7 days following restoration. No deviation was found from the standard acceptable test pattern obtained immediately after restoration.

Summary

Ery. rhusiopathiae culture vaccine in liquid form is known to be a relatively unstable biological product which loses the viability and virulence essential to potency at a relatively early date after production.

In the studies reported, *Ery. rhusiopathiae* vaccine prepared by desiccation from the

(*Continued on page* 30)

*Biological Research Laboratories, Pitman-Moore Company, Division of Allied Laboratories, Inc., Indianapolis.

Sulfaquinoxaline Medication Of Chickens*

ADA MARIE CAMPBELL, M.A., D. F. EVELETH, Ph.D., D.V.M., and ALICE I. GOLDSBY, A.B., Fargo, North Dakota

DELAPLANE,[1,2] Delaplane and Higgins,[3] Peterson,[3] Eveleth, Goldsby and Nelson,[4] and Armstrong and Bankowski[5] have found sulfaquinoxaline to be one of the most effective drugs for the prevention of pasteureilosis in poultry.

Observations by Bolin[7] indicate that chickens maintained on continuous feeding of a ration containing 0.025% sulfaquinoxaline are not susceptible to infection following the intravenous injection of doses of cultures of *Pasteurella multocida* that were lethal to non-medicated birds. He also observed that if medicated feed, containing 0.025% sulfaquinoxaline, were placed before the birds immediately following the injection of the culture, the losses were lower than in birds fed non-medicated feed.

More information regarding the rate of absorption and the persistence of blood levels of sulfaquinoxaline following different methods of dosing was needed to determine the most effective methods of administration. During the course of this investigation the paper by Schlenker and Simmons[6] was published. These authors found a very rapid accumulation of sulfaquinoxaline in chicken blood and diffusion into eggs, to a limited extent. According to them, acetylation was not extensive. They could detect traces of sulfaquinoxaline in the blood 112 hours after the medicated feed was withdrawn from the birds. They believe that a certain amount of sulfaquinoxaline is bound to hemoglobin.

White Leghorn cockerels weighing about 3 lb. each were used in most of the experiments reported here. An experiment designed to test the rate of absorption and accumulation in the blood was made by feeding the birds, *ad lib.*, rations containing 0.0125, 0.025, 0.05, and 0.1% of sulfaquinoxaline.

Blood samples were drawn at 18, 24, 42, 48 and 66 hours after the initial feeding of the medicated feed. The sulfaquinoxaline concentration of the blood serum was determined spectrophotometrically by a modification of the method of Bratton and Marshall[8]. These data, shown in figure 1, indicate that at the two higher levels there was a rapid accumulation of sulfaquinoxaline for approximately 18 hours. The sulfaquinoxaline after 48 hours was highest for the 0.1% feed but nearly identical in those given the 0.05% and 0.025% feeds. The medicated feed was given until the 14th day, at which time the blood serum content had reached an equilibrium and was nearly directly proportional to the level in the feed. Determinations of blood serum levels of sulfaquinoxaline were made at intervals after removal of the medicated feeds until the sulfaquinoxaline disappeared. Thirty-two hours after withdrawal of the treated feed, blood serum levels had all fallen to less than 2 mg. per 100 ml. of serum. However, 72 hours after medication was stopped, traces of sulfaquinoxaline remained in the blood of the birds fed the feed containing 0.1% sulfaquinoxaline.

*Published with the permission of the Director. North Dakota Agricultural Experiment Station, Fargo.

Progress Report—BJO 61, The Control of Fowl Cholera.

TABLE 1. Sulfaquinoxaline in Blood Serum at Hourly Intervals after Intramuscular Injection

	Sulfaquinoxaline with hyaluronidase			Sulfaquinoxaline without hyaluronidase		
Hours	Minimum mg./100 ml.	Maximum mg./100 ml.	Average mg./100 ml.	Minimum mg./100 ml.	Maximum mg./100 ml.	Average mg./100 ml.
1	17.4	30.2	22.8	17.4	30.2	24.5
2	21.7	30.2	28.5	22.7	30.2	27.3
3	23.6	30.2	27.7	20.3	30.2	27.0
4	20.6	26.7	23.4	20.3	30.2	27.8
5	19.7	30.2	25.2	18.0	30.2	27.0
6	21.7	30.2	25.8	21.7	30.2	26.0
7	23.9	30.2	26.5	21.7	30.5	26.4
8	21.7	30.2	27.5	19.3	30.2	26.7

Since the accumulation of any sulfonamide in the blood is dependent upon both the rate of absorption and the rate of excretion, it seemed desirable to investigate a more rapid method for establishing a high serum level of sulfaquinoxaline.

Sodium Salt of Sulfaquinoxaline by Intramuscular Injection

It has been shown previously[10,11] that hyaluronidase aids in the absorption of fluids and of calcium gluconate when incorporated in fluid parenterally given to sheep and calves. It was decided to test this enzyme with sulfaquinoxaline for chickens.

A group of chickens similar to those used in the feeding experiments was used for the evaluation of the intramuscular injection of the sodium salt of sulfaquinoxaline. All birds were given 0.5 ml. of solution containing 200 mg. of sulfaquinoxaline. Half of the birds received an injection containing 25 T.R. units of hyaluronidase. All injections were given intramuscularly in the large muscles of the lower leg just above the hock joint.

Blood samples were drawn at frequent intervals beginning 15 minutes after injections of the sulfaquinoxaline with or without hyaluronidase. There was such a wide individual variation in the sulfaquinoxaline content of the serum between similarly treated birds that the data have been grouped as maximum, minimum and average for hourly intervals after injection and are given in table 1.

There are two major considerations in the use of a drug such as sulfaquinoxaline. The poultryman is interested in maintaining in the blood or intestines a protective level of the drug against such diseases as coccidiosis and cholera, while the public health authorities are interested in the protection of people against toxic reactions from eating medicated chickens.

Chickens given various amounts of sulfaquinoxaline have been used for the determination of the sulfaquinoxaline content of their livers and kidneys. These data, with averages for groups of birds which were treated similarly, are given in table 2.

Summary

Sulfaquinoxaline has been found to be a highly effective drug in the treatment of fowl cholera. Data presented in this paper show that a high level of serum sulfaquinoxaline can be established by the intramuscular injec-

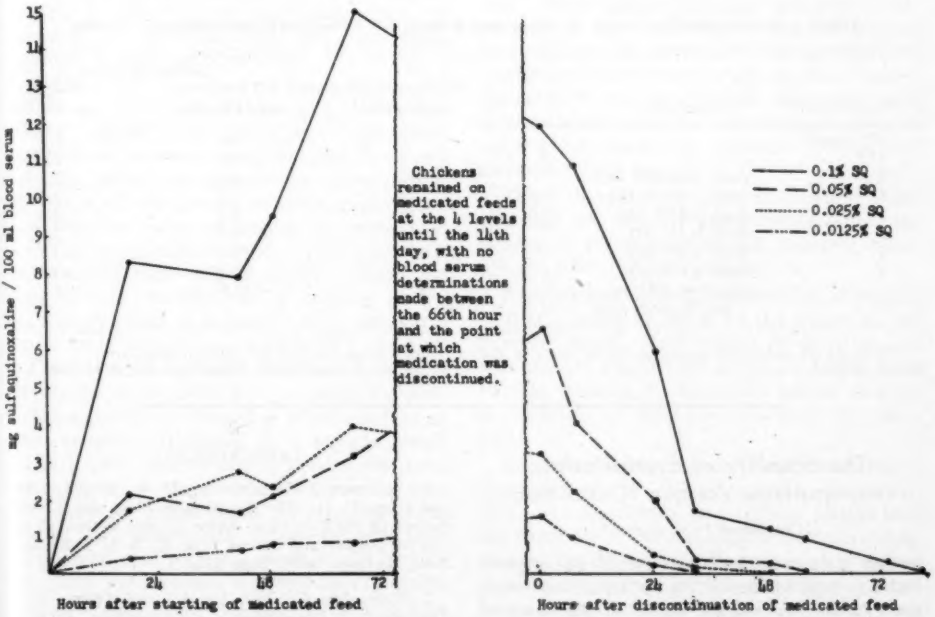
mg sulfaquinoxaline / 100 ml blood serum
Hours after starting of medicated feed
Chickens remained on medicated feeds at the 4 levels until the 14th day, with no blood serum determinations made between the 66th hour and the point at which medication was discontinued.
0.1% SQ
0.05% SQ
0.025% SQ
0.0125% SQ
Hours after discontinuation of medicated feed

Fig. 1—Sulfaquinoxaline in blood serum of chickens given four concentrations of sulfaquinoxaline in feed.

tion of sodium sulfaquinoxaline. The simultaneous feeding of a mash containing 0.025% sulfaquinoxaline will maintain a serum level that has been found effective in preventing losses due to fowl cholera.

Hyaluronidase incorporated in a sodium sulfaquinoxaline solution did not increase the rate of absorption of the sulfaquinoxaline solution when it was injected intramuscularly into chickens.

The storage of sulfaquinoxaline in the livers and kidneys of chickens is not great. The problem of human poisoning from eating chickens medicated with sulfaquinoxaline appears to be unimportant since poultrymen would not be likely to feed rations containing more than 0.05% except possibly for a limited length of time. The chickens fed mash containing 5% sulfaquinoxaline for seven days did not show any evidence of poisoning. There was, however, a slight decrease in the amount of feed consumed.

Acknowledgment

The authors wish to thank Wyeth, Inc., Philadelphia, Pa., for the hyaluronidase used in these experiments, and Merck & Company, Inc., Rahway, N. J., for the sulfaquinoxaline and financial assistance in conducting the investigation. The authors also wish to thank Armour Hatchery, Fargo, for the chickens used in this study.

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TABLE 2. Sulfaquinoxaline Levels in Livers and Kidneys of Sulfaquinoxaline-medicated Chickens

No. of birds*	Medication	No. of days of medication	Sulfaquinoxaline Livers mg./100 gm.	Sulfaquinoxaline Kidneys mg./100 gm.
1**(dead)	?	?	0.9	1.8
1**	?	?	4.0	2.2
5	feed, 0.0125% SQ[1]	14	2.6	1.3
5	feed, 0.025% SQ	14	3.2	1.4
5	feed, 0.05% SQ	14	3.3	2.3
5	feed, 0.1% SQ	14	3.7	2.6
1	feed, 1.0% SQ	13	13.4	17.4
5	feed, 5.0% SQ	7	11.7	12.4
2	injection, 66.6 mg. SQ per lb. body wgt.	1/3	17.6	14.5

*Chickens in same age group as those used in the blood studies.

[1]SQ—Abbreviation for sulfaquinoxaline.
**Birds submitted to laboratory for diagnosis.

The Stability of *Erysipelothrix rhusiopathiae* Vaccine (Desiccated)

(*Continued from page* 27)

frozen state was found to retain its original viability and virulence for at least two years and, further, to remain stable in the restored state for at least seven days when kept at 40 F.

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EDITORIAL COMMENTS

The editors and staff of VETERINARY MEDICINE wish you and your family a very Merry Christmas and a Happy New Year.

County Agents and Agricultural Vocational Teachers Cannot Legally Act as Serum Jobbers

The Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C., has ruled that under the laws and regulations governing the handling of anti-hog-cholera serum and hog-cholera virus, and under the laws and regulations applicable to Cooperative Agricultural Extension Work and Agricultural Vocational Education, county agents and vocational agriculture teachers, as such cannot qualify as dealers and, therefore, must be classified as consumers and purchase these products at consumers' prices.

This ruling is based on an opinion from the Solicitor's Office dated October 1, 1951, that county agents and vocational agriculture teachers are employed on a full-time basis and paid by public funds, and that consequently by virtue of the nature of their employment they may not properly engage in commercial activities in connection with or during the performance of their official duties. Under the definition of "dealers" as it appears in the Marketing Order, it is readily apparent that a dealer must engage in activities of a commercial nature either by being employed for a service charge or by conducting a sales business.

The Director of Extension Work notified all state extension directors in a bulletin dated July 10, 1951, that he cannot defend any practice whereby public employees whose salaries are paid from public funds are engaged in the sale of any commodity in competition with commercial retail dealers, which would include veterinary practitioners, and that county agents and other cooperative extension employees who are engaged in the sale of serums should discontinue the practice at the earliest possible date.

Editor's Comment

In most counties in the United States, the county agent is not engaged in handling hog cholera antiserum and virus at the present time, yet it is evident that in isolated cases this 1951 ruling on the subject was needed to stop the practice. Complete copy of the solicitor's opinion is available from Control Agency, 512 Porter Building, Kansas City, Mo.

▾ ▾ ▾

Dipping of Sheep in Benzene Hexachloride (BHC) at Public Stockyards under Bureau Supervision Authorized

In response to insistent requests from some of the states which receive, from public stockyards, considerable numbers of sheep which may have originated in areas known to have been infected or where sheep have been exposed to scabies, the U. S. Bureau of Animal Industry has agreed to supervise treating of such animals at public stockyards with BHC dips. More information and the broader experience in the use of this product in dipping sheep for scabies have led to the modification of previous instructions in this regard. Federal inspectors in charge at public stockyards have been authorized to supervise such state-required dipping of sheep if conditions hereinafter enumerated are met.

There should be definite information available that the state of destination requires the dipping of sheep involved and also that it recognizes BHC for that purpose.

Formal application for supervision of dipping in BHC should be made by the owner or authorized agent. Such owner or agent should also execute and deliver to the inspector form FI24-D waiving all claims for loss or damage to animals apparently resulting from this treatment.

The bath shall be maintained at the standard concentration of 0.06% gamma isomer of BHC. In the absence of a reliable vatside test, the capacity of the vat should be recorded at various depths for convenience and accuracy in using the following table showing the number of pounds of wettable BHC to use to each 100 gal. of water, depending upon the gamma

isomer content of the product:

Per cent gamma isomer content of BHC powder	Pounds of wettable BHC per 100 gal. of water
5	10
6	8
10	5
20	2-1/2
25	2-1/6

BHC is insoluble in water and must be maintained in suspension for the active ingredients to be effective. The powders have a tendency to settle rapidly when there is delay of only a few minutes in dipping. It is the inspector's responsibility to make sure that there is vigorous stirring and agitation of the vat contents from the bottom upward to bring the powder into proper suspension immediately preceding the dipping and whenever there has been even brief interruption in the operations.

Sheep should be immersed in the usual manner, making certain that each animal is held long enough to insure fair saturation of the fleece and wetting of the skin. The head of each animal should be ducked one or more times until thoroughly wet.

In replenishing the vat contents to compensate for dip carried away in the wool, the amount added should be 8% stronger than the original dip in order to maintain the proper strength. This is necessary because of greater loss of chemical than water; in other words, if 8 lb. of a 6% gamma isomer product were used for each 100 gal. of water in the initial charging, 8-2/3 lb. would be needed with each 100 gal. replenishment to keep the contents acaricidally active.

The entire contents of the vat should be replaced with fresh dip when a maximum of 3,000 sheep have been treated or when the solution becomes foul or otherwise contaminated with bacteria, as evidenced by blackish discoloration and gas bubble formation.

Precautions

In addition to the foregoing, it is important to remember that BHC is not bacteriostatic nor bactericidal and for this reason the dip may become contaminated and thereby be the means of exposing treated animals to certain infections. BHC must be used in unheated water not to exceed 80 F. as the dip becomes dangerous when heated. It should not be combined with other dips such as nicotine, lime-sulfur, or arsenical solutions. Only the wettable powders are to be used as there has not been sufficient work done with the emulsion concentrates to warrant their use at this time.

Because wettable chlorinated hydrocarbon compounds tend to accelerate rust formation, concrete vats are preferable to those made of sheet iron and steel.

The purpose of these revised regulations is to authorize Bureau supervision of dippings in BHC as an accommodation to states of destination requesting it. They should not be interpreted as altering the Bureau's position with regard to recognition of dips of this classification when federal regulations are applicable. In such cases nicotine sulfate and lime-sulphur are still the only ones permitted to be used.

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Enrollment in Schools of Veterinary Medicine

The total number of students enrolled for the academic year 1951-1952 indicates an increase of 53 over the preceding year for the 19 schools in the United States and Canada.

Excluding graduate students now holding veterinary degrees, of which there are 165, and special students, a total of 3,699 are enrolled for undergraduate work, which includes those at the universities of California and Illinois. These two institutions will graduate their first classes in the spring of 1952.

A total of 927 seniors expect to receive degrees at the close of the spring session.—*Jour. Am. Vet. Med. Assn.*, 119:466 (Dec.), 1951.

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Plaster of Paris for Packing the Anal Sacs of Dogs

A simple and rapid method of packing the anal sacs of dogs prior to their surgical removal is described by Wheat and Rhodes (*Jour. Am. Vet. Med. Assn.*, 119:446 [Dec.], 1951).

Rapid-drying plaster of Paris is mixed with water to form a paste of such consistency that it may be injected through the lumen of a 15-gauge hypodermic needle. The needle, with rounded point, is inserted through the duct into the gland and the plaster injected until the sac is distended. After approximately five minutes, the mixture has hardened sufficiently to make for ease in outlining the gland. The distended sac may be dissected free with blunt-pointed scissors through an incision made directly over its fundus.

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The ewe is the main reservoir of sheep parasites.—*Cecil Elder, D.V.M.*

"A Doctor for the Flock"

Dr. Frank C. Tucker, McK '09, Claypool, Ind., and his assistant, Dr. William Carr, are featured in the current (November 1951) issue of *Country Gentleman.*

This is not only a success story of building a profitable poultry practice, but one concerned with the value of veterinary service to the poultry industry. One now may use the designation "industry" in referring to poultry raising, not only because of its financial health but because of efficient, business-like methods of production of meat and eggs.

Photo Courtesy Country Gentleman

Dr. Frank C. Tucker, Claypool, Ind. (center) conducts autopsy examination on a group of chickens brought in by a client. Assisting is Dr. William Carr (left), who is associated with Doctor Tucker in an extensive general practice. Poultry disease control is an integral part of their work.

From modest beginnings as early as 1924, Doctor Tucker's poultry practice now consumes one-half of his time.

The Tucker-Carr practice includes some 15 to 18 calls a day, approximately one-third of these to consider disease problems in poultry. In addition, each month about 100 poultrymen bring birds to the office for diagnosis, treatment, or prescription. These veterinarians vaccinate up to 150,000 birds annually; blood-test another 60,000 for pullorum disease. Here, too, the practitioner serves in management and feeding problems as they pertain to disease control or as they may assist in producing improved gains or bloom. As consultant in these husbandry matters, Doctor Tucker is a qualified authority accepted by flock owners, broiler producers and hatcherymen alike in his community.

Charges for service vary in the same manner as is the case with cattle or swine. Office calls are $1.50 to $2. each. The same charge is made for autopsy examination of sick or dead birds which farmers may bring in. Vaccination is 1½ cents per head and up, depending on how many or how few birds there are, how far the doctor must travel, and how much assistance the flockowner supplies for the job. Farm visits to diagnose disease problems range from $2. to $3., plus travel time or mileage and any necessary drugs or supplies dispensed.

There exists not only opportunity for practitioners to develop a poultry practice in many rural communities, but a vital need for qualified veterinary service applied to the problems of avian disease.

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Doctor Coffin Making Parrot Disease Investigation

Dr. David L. Coffin, head of the Pathology Department at the Angell Memorial Animal Hospital of the Massachusetts S.P.C.A., Boston, is at present conducting an extended scientific investigation of parrot diseases in Peru.

Before proceeding with his expedition to the headwaters of the Amazon, Doctor Coffin addressed the First Pan-American Congress, which met in Lima, on the subject of infectious diseases of dogs. He also participated in the section devoted to veterinary education.

Doctor Coffin's journey to South America was made possible by a legacy received by the Massachusetts S.P.C.A., for the specific purpose of studying diseases of parrots. A complete report of his findings will be made available to veterinarians and others interested in the subject matter following his return to Boston.

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Veterinary Volunteer List Exhausted

The Army Surgeon General contemplates requesting the Office of Assistant Chief of Staff for Personnel, G-1, to order a limited number of veterinary Reserve officers to active duty. Quotas will be levied on the six continental Army areas.

The officers involuntarily ordered to active duty will be from among those veterinarians, registered under Public Law 779 and classified as Priority 1, who accepted commissions in the Reserve.

With the exception of ten Veterinary Corps Reserve officers ordered involuntarily to active duty shortly after Korea, requirements for additional Veterinary Corps officers have been met by volunteers.

Tail Setting

In tail-setting of the horse, one should insist that the tail be placed in a set for at least three months prior to the operation. This part of preoperative care is essential. Animals become accustomed to the tail-set and do not fight it after the operation. Its use also lengthens the muscles. If one performs an operation and then applies a tail-set for the first time, the tail is likely to become excoriated and sensitive. Ulcers may develop. Horses have a tendency to forcefully switch the tail from one side to the other, which may result in a sore tail or may cause it to become crooked regardless of the excellence of operative technic.

Local infiltration of anesthetic is preferred rather than epidural. This technic insures that the muscles are evenly cut. Under local infiltration muscle tension is retained, which is a great aid to uniform division of muscle bundles. A small knicking knife having a small shank is used. The instrument is inserted to the midline by a stab incision, avoiding the medial ventral vessels. The knife is then directed toward the muscles and, with lever-like action, they are cut. The same procedure is carried out on the opposite side. Some prefer to make one stab incision. Following the incision, one should not have infection and the tail should be placed in a tail-set and kept there until healing has taken place.—*James Farquharson, D.V.M.*

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The Viability of *Brucella melitensis* in Naturally Infected Cured Hams

Studies undertaken at the Purdue University Agricultural Experiment Station have indicated the viability of Brucella in fresh and cured pork cuts. Limited data have also been presented on the survival and distribution of *Brucella melitensis* in fresh pork.

Eleven yearling hogs, weighing approximately 300 or 400 lb., were purchased in May 1949 in southern Indiana from a herd which was exhibiting marked clinical evidence of brucellosis. Numerous abortions prompted the owner to dispose of the herd. The purchased hogs all had positive Brucella agglutination reactions as determined by the standard test tube method. All cultures which came from these hogs were identified as *Br. melitensis,* by the usual procedures. The significance of this type of infection in swine is becoming increasingly apparent in herds of the Midwest. The proved presence of this organism, by the work of McCullough, *et al.*, was revealed by the culture of mandibular lymphoids of 5,000 slaughtered hogs. Brucella was isolated in 35 instances. Eleven, or 31.4%, of the isolations were *Br. melitensis.*

As near as practical, all procedures in the processing of pork from the carcasses purchased from the infected herd were handled as the operation is done commercially. Immediately after slaughter, cultures were made from a number of areas of the carcasses. Such cultural work was repeated at intervals during the curing process of hams. Organisms were recovered from widely scattered tissues of the body in the first instance and in nine out of 15 hams for as long as 14 to 21 days after pumping and submerging in cover pickle. In the hams subjected to the smoking process, after 20 days in cover pickle, Brucella organisms were not recovered in any instance.—*Hutchings, et al., Pub. Hlth. Rept., Oct. 26, 1951.*

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During the period 1937-47, the reported rate of human brucellosis increased four to ten times in the districts of Minnesota not under the area plan of bovine brucellosis control. No significant increase occurred in a district of 21 counties under the area plan. During the same period, fluctuations in the cattle population occurred in similar proportions in all these districts. The area plan of bovine brucellosis control in Minnesota appears to have appreciable public health significance.—*Pub. Hlth. Rept., Aug. 19, 1949.*

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Lyxoflavin designates a new vitamin of the B complex. Researchers of the Merck Institute report its relaxing effect, growth and weight stimulating action, and suggest its possible action against cancer.—*Jour. Am. Chem. Soc., Nov. 1951.*

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Amounts of antibiotics produced in 1950 showed a considerable increase over 1949. Penicillin production and certification in the United States in 1950 was approximately 153 tons as compared with 98 tons in 1949; streptomycin, 22.5 tons and dihydrostreptomycin 79.5 tons (total 102 tons) in 1950 as against a total for the two products of 92 tons in 1949. Production of sulfonamides remained constant, totaling 2,511 tons in 1950 and 2,519 tons in 1949.

Hyperkeratosis (X-disease) Produced Experimentally in Nebraska

Recent reports of experimentally produced hyperkeratosis (X-disease) in cattle support the theory of the toxic etiology for this disease condition. Olafson and McEntee (*Cornell Vet.*, 41:107, 1951) reported that symptoms of bovine hyperkeratosis were produced by adding a feed concentrate to the rations. Since that initial report, McEntee, Hansel, and Olafson (*Cornell Vet.*, 41:237, 1951) have found a toxic fraction in the ether extract of the feed concentrate previously investigated by them. Dr. Kurt Wagener (*Jour. Am. Vet. Med Assn.*, 119:133 [Aug.], 1951) concluded from observations made in Germany that a wood preservative exerted the noxious influence and was the causal agent and that this could be demonstrated under experimental conditions.

To further support the theory that harmful agents may be present in prepared feed concentrates, Olson and Cook (*Am. Jour. Vet. Res.*, 12:261 [Oct.], 1951) observed the development of symptoms of typical hyperkeratosis in calves removed from environment where a natural outbreak had occurred. These were fed pelleted supplemental feed left over from that fed calves in a herd sustaining losses. No evidence was obtained that contact exposure with affected animals added to the severity of symptoms produced or to the length of time required for manifestation of typical symptoms of lacrimation, loss of hair, skin fissures, and buccal papilloma.

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Vacancies for Veterinarians in the Air Force

Doctors of veterinary medicine, both men and women, may now step straight from civil life into a commission in the United States Air Force, according to an announcement just released by Lt. Col. Charles D. Morat, Jr., Personnel Procurement Director of the First Air Force, Mitchel Air Force Base, N. Y.

Appointment to second lieutenancies may be made to men who have just graduated from schools of veterinary medicine or surgery approved by the surgeon general of the Air Force. For appointments above that grade, applicants must also be licensed to practice veterinary medicine and must have been engaged in the ethical practice of their profession for from one to 19 years, in order to be commissioned from first lieutenant to lieutenant colonel. For a full colonelcy, 26 years of practice is a prerequisite, in addition to evidence of notable contributions to the profession.

Complete information regarding these veterinary commissions may be secured by writing to the Air Surgeon, Headquarters First Air Force, Mitchel Air Force Base, N. Y.

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Veterinary Officer Decorated

Official U. S. Air Force photo

Brig. Gen. Delmar T. Spivey, (left), Commanding General, Far East Air Forces, 314th Air Division, congratulates Major Burt W. English, USAF (VC), on receiving the Bronze Star medal. Currently assigned as Director of Veterinary Services, 314th Air Division, Major English was decorated for outstanding service in the field of preventive medicine and in connection with Korean operations.

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Annual registration of veterinarians in Massachusetts will become law on January 1, 1952. The fee will be $5. and must be paid by all those registered in the Commonwealth who are now practicing or who expect to practice in the future. Dr. Gerry B. Schnelle, Boston, is secretary of the Board of Registration.

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Dr. C. E. Wicktor, 1917 graduate of the Kansas City Veterinary College, and now president of their alumni association, will open the annual midwinter conference of the California State Veterinary Medical Association, January 28, 1952, at the School of Veterinary Medicine, Davis. Doctor Wicktor is president of the California State Veterinary Medical Association.

PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

"Will you discuss", a veterinarian writes, "the shoeing of a horse lame because of pyramidal disease affecting a forefoot?"

First permit a statement about pyramidal disease. It is an inflammation of the periosteum and bone in the immediate vicinity of the pyramidal process of the third phalanx. Clinically the symptoms have the appearance of a ringbone involving the region of coronary border at the toe. Lameness usually is most pronounced during the trot. In advanced cases, the pyramidal process may be pulled loose from the body of the third phalanx.

Certainly the first step in the attempt to relieve the lameness is to reduce horn pressure on the sensitive area by thinning the horn over the swollen area of the foot. Shoeing has a similar objective—that is, relieving pressure during locomotion. This is accomplished by so trimming the hoof that it will be set down normally; that is, the foot axis or the direction of the three phalanges must be in a straight line which should parallel the wall of the hoof at the toe. The shoe should have a "rolling toe", which means that the toe of the shoe is turned up to an extent equalling one-half the thickness of the shoe, and involving only the toe of the shoe. If the "roll" is carried too far back on the shoe, it will make the animal "snowball"-footed and this must be avoided. Just before applying the shoe, a layer of horn about one-eighth inch thick should be removed from the lower or plantar border of the wall, the region just under the pyramidal process, so that after the shoe is in position a five-cent piece can readily be passed between the hoof at the toe and the shoe, thus relieving still more the pressure in the painful pyramidal process. Some anatomists designate this as the "extensor process" of the third phalanx.

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Bicarbonate of soda at the rate of one-half teaspoonful, together with chloride of soda, one teaspoonful, dissolved in a quart of water, administered *per os,* is reported to be excellent first-aid treatment in the handling of shock following severe burns. Its early administration, until plasma is available, is said to determine the difference in many instances between life and death.

The Veterinary Record for July 21, 1951, in its "Correspondence" column presents a communication from S. J. Khambete, assistant professor of medicine, Bombay Veterinary College, Parel, Bombay, under the caption, Calcium Sulphide in the Treatment of Warts, in which the following appears: "I have treated many dogs showing multiple warts in the buccal cavity with calcium sulphide in doses of 1 to 2 gr. daily for about three weeks, with the result that all the warts shrivelled and ultimately disappeared completely. I have also used this drug in cutaneous warts of calves in doses of 25 to 35 gr. administered by mouth daily. Appreciable decrease in the size of the warts was noticed after eight days' treatment, and they disappeared in about one month's time. The cases treated did not show any toxic symptoms nor any other effect on their general health. So far the recurrence of the warts has not been reported in the cases treated by me." The writer is not familiar with this method of handling and therefore cannot comment on it.

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A satisfactory method of anesthesia via the intravenous route in large, otherwise unmanageable hogs is to snub the animal to a post, disinfect the area over the ear vein, then by appropriate clamping, raise the vein for puncture. A hypodermic needle is inserted and held in position by a second clamp; the first clamp is then removed. Chlorate hydrate in 25% solution is the agent used. The dosage is 1 cc. for every 5 lb. of body weight. When the "pinching the animal's nose" reflex is lost, a satisfactory degree of hypnosis has been obtained. The effect of the chloral disappears in less than one hour.

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The report of the New York State Veterinary College, 1949-1950, in an article by Doctors Fox and Roberts, has this to say about the clinical treatment of blackleg in cattle: "Encouraging results have been obtained in the treatment of 21 cases of blackleg in cattle by a combination generally consisting of blackleg antiserum, penicillin, and sulfamethazine or sulfamerazine. Penicillin was used alone in a few cases with good results."

PUBLIC HEALTH

JAMES H. STEELE, D.V.M., M.P.H.
Atlanta, Georgia

Q Fever

Drs. Edwin H. Lennette and William H. Clark of the California Department of Public Health summarize in a recent article on Observations on the Epidemiology of Q Fever in Northern California (*Jour. Am. Med. Assn.* 145:306 [February 3], 1951) in part as follows:

"Studies conducted in both northern and southern California have shown that a large proportion of patients with Q fever have had exposure to domestic livestock by virtue of either occupation or residence. Contamination of the environment with excreta or secreta of infected animals has been suggested as a means of dissemination of the Rickettsia from animal to man. This finds support in the demonstration of the causative organism in these excreta and secreta and recovery of the organisms from dust-laden air of sites on which infected animals were present. Evidence concerning the portal of entry is not conclusive but suggests that human infection may occur through ingestion or inhalation of the Rickettsia."

These findings by Lennette and Clark are interesting inasmuch as they present another important problem for veterinary public health. It is obvious that Q fever will continue to be a serious public health problem as long as it continues to exist in animals. We are fortunate in one sense that it does not cause any apparent illness in animals so far as has been observed in the United States. Infected animals that have been studied in California, including cattle, sheep and goats, have not demonstrated symptoms of disease. There has been no interference with lactation, gestation or deglutition. It is thought that animals, as well as man, probably become infected through inhalation of the Rickettsia, although ingestion no doubt plays a part under certain conditions. Pasteurization of milk is important to its control but as is pointed out in the discussion of the paper, it would only contribute to the control of about one-third of the cases that were reported in California. The other two-thirds would probably still be due to contact with animals or air-borne infection originating from animals. The solution of Q fever as a public health problem calls for continued cooperative efforts on the part of all members of the public health team, including veterinarians, physicians, entomologists and laboratorians.

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Plague

Public Health Reports carries the account of the second human death from plague in New Mexico. The previous case had occurred a year earlier. Both of these cases were contracted from wild rabbits. Previously, plague had been reported in rabbits in New Mexico, California and Washington, but there had been no human death attributed to handling rabbits. Both of these cases occurred in hunters who had shot rabbits and then had skinned them.

Another aspect of this problem that causes everyone to stop and consider, is the interstate movement of cottontails and other rabbits for hunting purposes. It is well known that hunting clubs in the northeastern and midwestern United States often order wild rabbits from states west of the Mississippi River. One of the states that supplies these rabbits is New Mexico. The New Mexico Public Health authorities warned all of the states a year ago against this hazard, and a number of these have taken action which prohibits the importation of rabbits or rodents from any other state, especially those that are known to be from plague or tularemia infected areas. If plague is present in rabbits and other ground rodents, cases of the disease may occur in dogs, especially hunting dogs, which may catch diseased animals and become infected in that manner. No such cases have been reported in literature to date.

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The Philadelphia Public Health Survey of 1950 reviews the veterinary public health activities of the city health department. These include milk and meat products inspection and animal disease control. It is recommended that a division of milk and meat inspection be established in the section of environmental sanitation and that at a later date their activities be expanded to include epidemiologic studies of animal diseases transmissible to man. The need for graduate training of veterinarians in public health agencies is stressed in the original report.

VETERINARY PARASITOLOGY

A. O. FOSTER, B.A., M.A., Sc.D.
Beltsville, Maryland

The Biology of Lungworms

Fifteen years ago Porter[1] concluded that swine lungworms (Metastrongylus) do not suck blood, as commonly supposed, but ingest inflammatory exudate in the air passages. A recent study[2] confirms this conclusion and adds new data on the effects and orientation of both Metastrongylus and Dictyocaulus. Normally, the worms are neither coiled nor located in the bronchi and trachea. Rather, they lie with their anterior extremities toward the distal ramifications of the bronchial tree, and their tails toward the larger bronchioles and bronchi. Worms are often displaced by coughing efforts of the affected host-animal, but strive to wiggle back into favorable locations.

Invariably there is some degree of bronchitis, presumably caused by the irritating action of the worms. The resulting inflammatory exudate, which is the principal food of the parasites, is moved upward from the smaller to the larger passages by the normal cleansing action of the lungs and by coughing. The worms are thus oriented advantageously for feeding, and their food is provided as a natural consequence of the induced inflammatory process.

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Parathion Tested on Cattle Ticks

Dilute concentrations of parathion (0,0-diethyl-0-p-nitrophenylthiophosphate), judging from limited trials,[3] are efficient eradicators of *Boophilus microplus*. Using a 1:10,000 concentration of a preparation containing 20% parathion and 7% other ethyl thiophosphates, satisfactory results were obtained in five infested cattle; the animals were not injured, only a few engorged nymphs survived, and a few females laid viable eggs. Tests on eight cattle with another preparation containing 20% parathion, at concentrations of 1:10,000 to 1:20,000 gave good results in all cases, but best results with the highest concentration (two animals used).

This chemical has been used to combat some pests of trees, crops and forage, but only under rigid safeguards to the user, other individuals and mammals. It is generally regarded as too toxic for direct application to livestock. The present report is of interest because of the low concentrations employed, the lack of injurious effects, and the high efficacy against ticks.

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Nutritional Paresis *versus* Cerebrospinal Filariasis

A major and mysterious affliction of livestock, best known in Japan but widespread in the Orient and possibly elsewhere, has received increased attention during recent months[6,7,8]. The disease is characterized by well marked cerebrospinal symptoms and lesions, and often manifests itself as a kind of epizootic lumbar paralysis. It has been known for over 40 years, and cattle, sheep, goats, horses, and some wild ruminants are susceptible.

Reportedly, for a dozen years, veterinary institutions of the Orient have taught that filarial worms (*Setaria digitata* and possibly others) are the probable etiological agents of the condition. Innes,[6] in several reviews, has outlined the basis for this belief and has given valuable accounts of the background and nature of the malady. There is, however, the more recent view, expressed by Bush, that the condition is a nutritional paresis not associated with filarial worms but more probably with phosphorus deficiency. This interpretation was supported by experimental work designed especially to check upon the possible role of filarial worms. The nutritional explanation is therefore convincing but not conclusive. Conceivably, both views could be substantially correct since more than one condition may be involved or both factors, namely, filarial infection and deficiency, may be jointly responsible for the malady.

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[1]Porter, D. A., The Ingestion of the Inflammatory Exudate by Swine Lungworms. *Jour. Parasitol.*, 22:411, 1936.

[2]Soliman, K. N., Observations on the Orientation of Certain Lungworms in the Respiratory Tracts and on their Feeding Habits. *Brit. Vet. Jour.*, 107:274, 1951.

[3]Legg, J., Diethyl-p-nitrophenylthiophosphate (E605): A Note on its Effects on the Cattle Tick *Boophilus microplus* Canestrini. *Aust. Vet. Jour.*, 26:9, 1950 (*Abs. Vet. Bul.*, 20:447, 1950).

[6]Innes, J. R. M., Nervous Diseases of Domesticated Animals caused by Filaria (*Setaria digitata*). *Vet. Med.*, 46:192, 1951.

[7]Innes, J. R. M., Some Nervous Diseases of Goats. *Vet. Rec.*, 63:186, 1951.

[8]Bush, D. L., Lumbar Paralysis of Ovine Species in Japan Reportedly caused by *Setaria digitata*. *Jour. Am. Vet. Med. Assn.*, 118:388, 1951.

POULTRY PRACTICE PROBLEMS

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

Goose Raising designates the recently revised issue of USDA Farmers Bulletin 767. According to this bulletin, geese make up less than 0.2% of the total poultry raised in the United States. The recent high prices of all meats has, however, stimulated increased interest in the rearing of geese and commercial production of day-old goslings.

Some of this increased interest has come from the use of goslings as weeders by growers of certain crops. Cotton and strawberry growers are examples of farmers who utilize geese to help keep weeds under control. Both young and older geese may be put in the fields in the spring while the weeds are small, using five to seven geese per acre. According to this bulletin, they may be kept in strawberry fields until the berries are nearly ready to ripen. They will not eat the berries. When the berries begin to ripen, it is necessary to furnish other range until the berries have been harvested. Geese will not eat cotton plants and can be used throughout the season for weed control.

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In a study on the feeding habits of mosquitoes and their effect on poultry, Edgar, *et al.*, (*Proc. 40th Ann. Mtg. Poultry Sci. Assn., 1951*) found that one species, *Culex quinquefasciatus,* showed a preference for avian blood. They also found that when the population of this species of mosquito became great enough in a laying pen there was a significant drop in egg production. Furthermore, this mosquito caused a decrease in rate of growth in chicks, when chicks were exposed to it in any number.

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Hoyt, Pomeroy and Roepke (*Am. Jour. Vet. Res.,* 12:329 [Oct.], 1951) have verified the reports of several other investigators that infectious sinusitis of turkeys is caused by a filtrable agent which can be propagated in chicken embryos. They found that the seven-day-old embryos are best suited to the cultivation of the agent and that the yolk sac produced the highest concentrations. It was found to survive longest in yolk. In yolk from infected embryos, it remained alive for at least 180 days when stored at —40 C.

Dunlap and Corbett (*Proc. 40th Ann. Mtg. Poultry Sci. Assn., 1951*) made a survey in New Hampshire on the effects of vaccination of 780,224 chicks against infectious bronchitis. They found that poultrymen who vaccinated their birds after eight weeks of age experienced little or no postvaccination troubles regardless of season. When chicks were vaccinated at four weeks or younger, postvaccination symptoms persisted longest. Those who vaccinated this age group in the winter experienced more difficulties than those who vaccinated during the summer season.

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Hayfields are the favorite and most dangerous nesting places for hen pheasants according to studies made at the Pennsylvania Agricultural Experiment Station (Bul. 540). Losses from nests destroyed, egg infertility and hen pheasants killed by mowers considerably outweigh those from hunters and winter mortality. In one group of 77 nests studied, 61% were destroyed by haying operations, and only 17% were hatched out successfully. The remaining 22% were lost as a result of plowing, planting, harvesting and predation.

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Newcastle disease virus was found by Hofstad (*Am. Jour. Vet. Res.,* 12:324 [Oct.], 1951) to be present in the blood, spleen, lung, trachea, and intestinal contents in 24 hours following inoculations of chickens with a virulent field strain of the virus. It persisted in all of these tissues for six days and for seven days in the blood, lung and trachea. The infectivity-neutralizing antibody and the hemagglutination-inhibition antibody were detected by the fifth day in these experimental chickens.

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The large surpluses of potatoes which occur in the duck-producing sections of Long Island stimulated Heuser and Scott (*Poultry Sci.,* 30:672 [Sept.], 1951) to determine the value of potato meal as a feed supplement for ducks. They found that up to 30% of potato meal could be substituted for various grain portions. No difference between dehydrated and air-strip dried potato meal was observed.

The Intramuscular Use of Terramycin in the Treatment of Mastitis Due to *Pseudomonas aeruginosa*

CORNELIA M. COTTON, Ph.D., T. A. LADSON, JR., V.M.D., and PATRICIA FELL, B.S.

An 11-year-old, 1,460-lb. dairy cow was treated with terramycin for mastitis caused by *Pseudomonas aeruginosa.*

History

When first observed by the veterinarian, one quarter of the udder was badly infected, and the whole udder was very hard and hot. Penicillin in oil (1,500,000 units) and sulfathiazole were administered every second day, but the condition became steadily worse. Temperatures varying from 105 F. to 108 F. persisted, and the udder became harder and hotter. Scar tissue was formed and, in time, the outer layer of the skin peeled off. The weight loss of the animal was enormous, dropping from 1,460 to 800 lb. within a few weeks. The cow refused to eat anything except a very small quantity of hay. Report of a consultation of veterinarians indicated that the udder would rupture and the cow could not withstand the high fever.

Treatment

Terramycin (50 gm.) was suspended in 175 ml. of distilled water and 10 ml. amounts were injected intramuscularly into each of 20 areas. Because of the slow absorption of the suspension of terramycin from muscular tissue, it remained effective for a long period of time.

Ten days following the first treatment, a second was given in a similar manner, using ten sites of injection. In conjunction with the terramycin, nux vomica and glucose injections (500 ml.) were given every other day. Terramycin ointment was instilled directly into the udder daily toward the end of the period of treatment.

Results of Treatment

Within 24 hours after the first intramuscular injection, a decided improvement was noted in the condition of the cow. The temperature had decreased noticeably and the animal started to eat. Within two days after the first treatment, the consistency of the secretion from the infected quarter changed from a bloody, pus-like substance to a whey-like material containing a few solid milk particles. Following the second treatment, the temperature of the animal returned to normal.

Twenty-three of the 30 sites of inoculation abscessed and required treatment several times a day. About a week after the abscesses had formed, they extruded a ropy material and began to heal slowly. Those that developed from the second treatment were not as severe as those from the first. Most were lanced, and those not so treated remained as hard lumps for several weeks before they finally disappeared.

Two months after the treatment was inaugurated, the animal was gaining weight and giving a good supply of milk from three quarters. The infected quarter was still hard and nearly dry, while the remainder of the udder was soft and pliable.

Laboratory Findings

The first samples of milk were brought into the laboratory the day of the first treatment with terramycin, and there was isolated a typical Gram-negative rod, *Pseudomonas aeruginosa,* producing characteristic blue-green color in media. A second group of samples was cultured two days after the first treatment. At this time milk and pus from an abscess at an inoculation point readily yielded *Ps. aeruginosa.* Blood cultures were sterile.

Laboratory examinations made after the second treatment showed the milk to be negative for *Ps. aeruginosa.* Cultures of pus from abscesses showed a Gram-negative rod, similar in most respects to this organism.

Cultures of milk and pus made ten days after the second treatment were negative, and all subsequent cultures have been negative for the organism.

Conclusion

A cow, valuable for breeding purposes, was saved by the use of terramycin given intramuscularly. While the animal still has a blind quarter, this may be due to the long delay before treatment was used, rather than to the treatment itself.

The chief disadvantage in the treatment, aside from the high cost of the antibiotic, was the abscess formation. It is true, however, that frequently *Ps. aeruginosa,* when present in the body, does produce abscesses at the site of

wounds. The intramuscular technic of administering terramycin was used in guinea pigs[1] without such unfavorable results. It may be possible, therefore, that this effect was due to the organisms and not to the terramycin.

REFERENCE

1. Cotton, Cornelia M., and Swope, R. E., A Study of the Effect of Aureomycin, Terramycin, and Neomycin on Brucellosis in Guinea Pigs. *Proc. Internat. Micro. Cong.*, Rio de Janeiro, 1950.

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Edema of the Glottis in the Chinchilla

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Edema of the glottis, referred to also as edema of the larynx, and edematous laryngitis is not uncommon in cattle and horses. Etiology ranges from mechanical injuries and irritating inhalants, such as chloroform, to infections, urticaria, anaphylaxis, and unknown causes. Hives in the spring and actinobacillosis have also been mentioned as responsible for the pathology observed.

There is little reference in the literature to this anomaly in the chinchilla, and this is the first instance observed by the writer. Common colds are frequent in these fur-bearing animals and differentiation may not have been made in some cases where the recovery was effected under therapy commonly used to relieve symptoms of "colds."

The chinchilla presented for examination was the second one noticed by the rancher. The first one showing symptoms suspicious of edema of the glottis died and on autopsy the only lesion demonstrated was swelling and edema in the laryngeal region. The animal died from strangulation on milk that had been given it in a coaster. Appetite of those affected does not seem to diminish.

At morning inspection, inspiratory dyspnea could be heard several feet from the cage. The attendant believed the animal to be suffering from a cold and turned the heat on in the next box. Labored inspiration was somewhat increased within an hour, when examination was made. There was no nasal exudate and the patient sat in a cramped position with ears drooped. Temperature was normal. A distinct fremitus over the throat was evident on palpation and swelling of the laryngeal region could be distinguished. Pressure over the larynx caused the animal to cough and go into convulsions, from which it recovered slowly.

History and examination revealed no specific cause for the disturbance and edema of the glottis was suspected. Two milligrams of benadryl® (diphenhydramine hydrochloride) were administered intramuscularly and in a few minutes considerable relief was apparent. Injection of the antihistamine was repeated two hours later, at which time there was little effort on inspiration. Two hours following the second injection, all symptoms were relieved and the animal was eating. The following morning there was complete return to normal.

All chinchillas on the ranch are given timothy hay. It is believed that the presence of some foreign weed in the hay offered was responsible for the symptoms of allergy, manifested as edema of the upper respiratory regions.

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External Fistula in a Six-Week-Old Pig

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The patient presented for treatment was a six-week-old Yorkshire pig with an external fistula, opening in the region of the scrotum. It had been castrated by the owner about two weeks previously at which time scrotal hernia was not noticed, if present. On examination it was found that a loop of small intestines had descended through the ring and a perfect external fistula had formed. Feces passed through the anus and the fistulous tract.

An operation was advised to correct the condition. The anesthetic used was nembutal, 1 gr. per 5 lb. of body weight given intraperitoneally. The pig was tied on an operating table in dorsal recumbency and the area over the inguinal ring, also the opening, prepared for operation.

An incision about two inches long was made over the ring. By blunt dissection and using the fingers, the loop of intestines was picked up, with steady traction applied at the same time the skin around the opening was incised, removing the fistulous tract and loop of intestines from the scrotum. The portion of skin containing the fistula was then removed, leaving an opening in the intestines. This was then closed, using a double row of Lambert suture. Intestines were cleansed with antiseptic solution and replaced in the abdominal cavity. The ring was sutured and skin incision closed. Opening in the scrotum was not sutured.

The pig made an uneventful recovery, reaching market weight at the same time as its litter mates.

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ITEMS OF VETERINARY INTEREST

Economists disagree as to the influence of the greatest tax bill in the history of this country.

People on farms made up 35% of the nation's population in 1910. They now constitute only 16% of the total.

The ring test (A.B.R.), agglutination test for Brucella in milk samples, is officially recognized in Denmark. This test is employed in conjunction with the blood test for herd accreditation.

Concern is expressed by livestock growers over the announcement of increased numbers of beef cattle reported in feedlots and on pastures and ranges. The recent report of 90,000,000-plus head of cattle on American farms and ranches and concentrate feeds in short supply may be followed by extensive marketing during a short period. Pastures will provide adequate feed only if brought into maximum production.

The rate of government defense spending is now nearly three times that of a year ago.—*U. S. Dept. of Commerce.*

Cattle slaughter for 1951 will likely total no more than 18,000,000 head even with increased marketings in the last three months. The 18,000,000 estimate is the smallest annual slaughter figure since 1943.—*Agr. Sit.*

Ground corn cobs, plus a protein-mineral supplement, have been shown by investigators at Purdue University as a new feeding concept, converting what is ordinarily considered waste feed material into beef.

Production of Insecticides

	Jan.-June 1950 lb.	Jan.-June 1951 lb.	% Increase
DDT	30,330,000	47,778,000	58
BHC	25,515,000	55,583,000	118

Exerciser for Bulls

Illustrated is the exerciser designed and in use at the Bureau of Dairy Industry, experiment farm, Beltsville, Md. A circular framework, with a radius of approximately 22 ft., is mounted on wheels. Beams project from the center, like spokes from a hub. They are attached to a turn-plate which rests on a pin set in the post at the center and toward the outer edge are supported on wheels which travel on a concrete track. Bulls are hitched or tied in spaces between the beams at the outer edge of the circle and compelled to walk on a circular track.